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ROBERT OLESEN, *Assistant Surgeon General, Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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PROVISIONAL MORTALITY RATES FOR THE FIRST 9 MONTHS OF 1938

The mortality rates in this report are based upon preliminary data for 42 States (District of Columbia included as a State), Alaska, and Hawaii for the first 9 months of 1938. Comparative data for 40 States (District of Columbia included as a State) are presented for the first 9 months and by the 3 quarters of 1938 and 1937.

This report is made possible through a cooperative arrangement with the respective States, which voluntarily furnish provisional quarterly and annual tabulations of current birth and death records. These reports are compiled and published by the United States Public Health Service.

Because of lack of uniformity in the method of classifying deaths according to cause, and because a certain number of certificates were not filed in time to be included, these data may differ in some instances from the final figures subsequently published by the Bureau of the Census.

In the past, these preliminary reports have provided an early and accurate index of the trend in mortality for the country as a whole. Some deviation from the final figures for individual States is to be expected, because of the provisional nature of the data. It is believed, however, that the trend of mortality within each State is correctly represented. Comparisons of specific causes of death among different States are subject to error because of differences in tabulation procedure and completeness of reporting. Comparisons of this nature should be made only with the final figures published by the Bureau of the Census.

The data for the first 9 months of the year indicate that the mortality experience for 1938 will be one of the most favorable on record. The mortality rate for all causes, 10.5 per 1,000 total population, is 6 percent less than the corresponding rate for 1937 and is also less than the rate for 1933, 10.7, which is the lowest on record. The decrease in the mortality rate is widespread; 38 States reported a lower rate than in 1937, while in 2 States the rates for 1937 and 1938 were the same.

Although this decrease in the death rate results principally from a decrease in the prevalence of influenza and pneumonia, nevertheless every important cause of death except cancer has been less prevalent during the first 9 months of 1938 than during the corresponding period

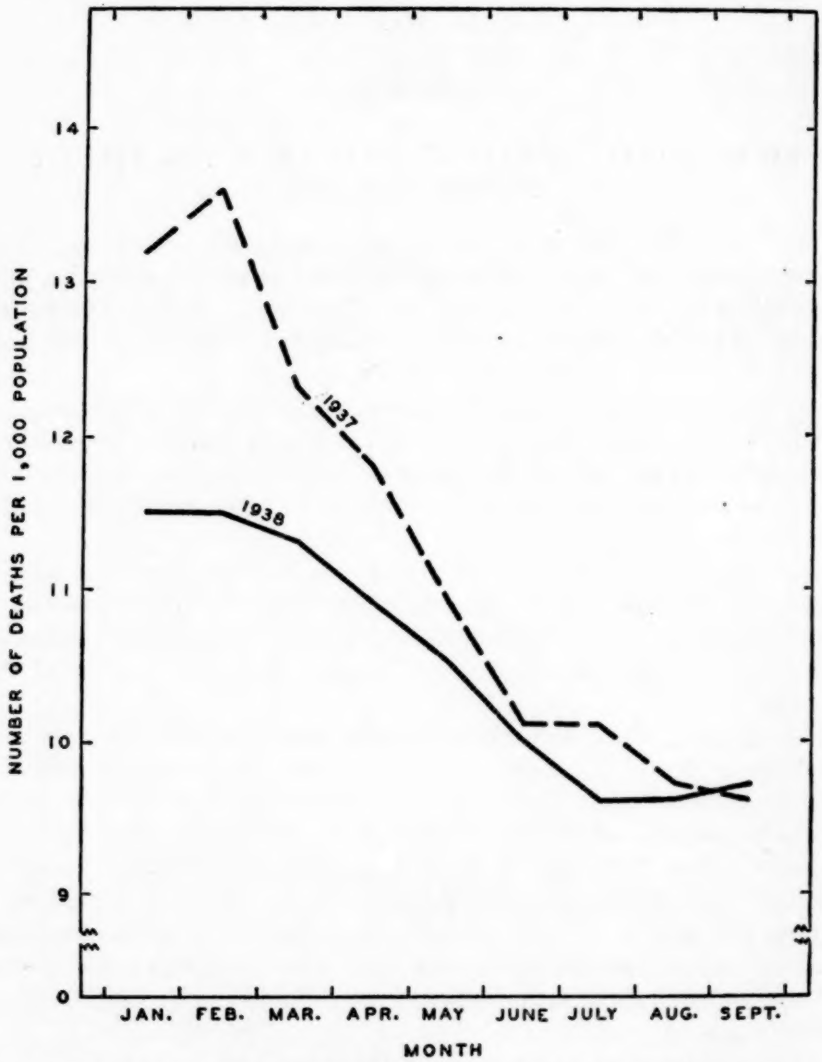

FIGURE 1.—Comparison of death rates, by months, for the first 9 months of 1938 and 1937

of 1937. The only disease other than cancer, for which reports are available, to show an increased death rate is measles, which has taken more than three times as many lives during the first 9 months of 1938 as in the corresponding period of the preceding year.

Perhaps the most striking decrease occurred in the mortality rate from accidents, especially automobile accidents. The relative num-

ber of deaths from automobile accidents is nearly 20 percent less than in 1937. Moreover, only 6 of the 40 States for which data are available reported more deaths from automobile accidents in 1938 than in 1937. The decrease in automobile accidents is especially gratifying, since it is probably due largely to the increased efforts of public officials, automobile clubs, and other agencies to arouse public consciousness of this hazard.

The death rate from tuberculosis is nearly 10 percent below that of last year, and the present indications are that the final rate will not be greatly in excess of 50 per 100,000 population. Both infant and maternal mortality have continued to decrease; the former is 9 and the latter is 13 percent less than in 1937.

The birth rate has increased for the second consecutive year and the final rate will probably be the highest since 1931. The crude rate of natural increase for the first 9 months of 1938 was 6.5 per 1,000 population.

Provisional mortality rates from certain causes in the first 9 months of 1938, with comparative provisional data for the corresponding period in preceding years

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid and paratyphoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Acute poliomyelitis and polioencephalitis (16)	Encephalitis, epidemic or lethargic (17)	Epidemic cerebrospinal meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the heart (90–95)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130–132)	All accidents (176–195, 201–214)[1]	Automobile accidents (206, 208, 210)[1]
40 STATES [2]																								
January–September:																								
1938	10.5	17.0	48	4.1	1.3	2.8	1.0	3.3	1.3	10.6	0.3	0.6	0.8	47.2	118.2	24.5	84.2	271.4	64.7	63.5	9.3	76.3	69.1	22.3
1937	11.2	16.3	52	4.7	1.5	.8	1.6	3.5	1.4	31.3	1.0	.7	1.8	52.2	115.1	24.7	85.4	271.4	86.0	66.6	9.1	78.9	78.6	27.7
January–March:																								
1938	11.4	16.5	51	4.3	.6	3.8	1.7	3.1	1.9	20.0	.3	.6	1.2	48.3	118.4	27.2	91.5	299.2	102.3	57.1	4.2	83.0	64.9	20.8
1937	13.0	15.5	62	5.4	.8	.7	2.5	3.1	1.9	72.1	.2	.7	2.6	55.7	114.7	29.4	96.3	315.5	149.6	61.3	4.3	87.7	73.2	25.8
April–June:																								
1938	10.5	16.7	48	4.1	1.0	4.1	1.0	3.6	1.0	8.2	.3	.6	.8	49.3	119.1	24.5	84.4	273.6	59.7	64.6	9.5	78.1	65.4	20.4
1937	10.9	16.0	49	4.6	.9	1.3	1.7	3.0	1.1	18.5	.3	.6	1.8	53.6	115.0	23.5	84.6	267.9	74.6	64.4	7.1	80.7	76.1	26.0
July–September:																								
1938	9.6	17.8	44	3.9	2.1	.7	.4	3.1	1.2	3.8	.4	.7	.5	44.2	117.1	21.8	76.7	241.9	32.8	68.5	27.6	68.0	77.0	25.5
1937	9.8	17.4	46	4.1	2.8	.5	.5	4.3	1.1	4.2	2.4	.7	.8	47.4	115.5	21.3	75.5	231.8	35.0	73.8	15.7	68.4	86.3	31.2
Metropolitan Life Insurance Co., industrial policyholders, ages 1 and over (January–September):[3]																								
1938	7.7	------	------	------	1.0	2.0	1.2	2.2	1.4	7.4	------	------	------	47.6	95.4	24.4	57.6	[4] 151.8	53.1	------	[5] 7.3	[6] 53.1	48.2	16.9
1937	8.4	------	------	------	.9	1.2	1.7	3.3	1.5	21.0	------	------	------	53.0	93.4	25.3	59.0	[4] 158.8	71.4	------	[5] 9.0	[6] 55.1	54.0	20.2
JANUARY—SEPTEMBER																								
Alabama:																								
1938	10.3	21.5	63	6.5	2.3	7.6	.6	6.8	2.9	26.3	.6	.6	2.3	55.4	55.2	11.5	68.4	162.7	73.5	70.8	21.0	77.1	64.6	18.4
1937	10.7	21.3	65	5.9	2.2	.1	.3	7.3	2.2	57.2	.6	.5	4.0	62.4	57.5	9.8	64.2	159.6	87.9	66.3	17.7	76.5	69.6	21.3
1936	10.9	21.6	66	6.5	2.7	.8	.4	2.9	2.8	56.9	1.3	.3	.8	65.5	57.8	12.5	65.8	146.7	104.0	69.4	17.9	78.8	------	------
Alaska:																								
1938	22.5	30.0	(7)	(7)	2.1	2.1	2.1	80.6	4.2	53.0	2.1	(8)	(8)	507.2	78.5	(8)	157.0	275.9	256.8	44.6	(8)	12.7	214.3	(8)
1937	18.7	21.6	136	12.4	2.2	4.4	2.2	37.9	(8)	49.0	4.4	2.2	17.8	385.5	57.9	6.7	64.6	343.2	182.7	66.8	11.1	24.5	185.0	2.2

California:																								
1938	12.0	16.3	43	3.6	1.1	1.2	.4	2.6	1.4	4.2	.3	.7	.9	67.0	136.6	24.0	87.9	343.2	56.0	75.8	8.2	80.9	93.7	40.9
1937	13.2	15.1	54	4.4	1.0	.7	.8	5.2	1.6	25.5	1.3	.8	1.9	75.4	138.4	26.4	85.3	368.0	86.7	84.3	11.6	84.1	105.5	48.1
1936	12.4	13.7	51	5.0	1.1	3.1	1.7	2.1	1.7	13.0	.6	.6	2.2	76.8	143.3	23.4	85.4	326.4	69.5	82.4	8.9	83.0	------	------
Colorado:																								
1938	11.5	18.9	53	4.6	1.6	3.7	1.0	4.0	3.4	13.7	.6	1.9	.6	63.4	116.0	17.7	89.8	238.2	94.8	72.1	13.2	84.1	92.9	30.8
1937	13.4	18.7	70	5.8	2.2	.2	2.4	5.5	2.5	61.0	4.4	1.2	3.7	68.0	116.3	16.0	86.0	212.2	184.4	84.0	23.2	80.0	97.4	35.5
Connecticut:																								
1938	10.0	13.5	36	2.8	.5	(8)	.3	.5	.7	4.1	(8)	.2	.2	34.9	139.1	28.3	85.8	245.6	52.4	49.2	3.2	78.8	70.7	17.6
1937	10.2	12.9	41	3.0	.2	.8	.8	1.4	1.1	13.9	.4	.4	.8	38.1	125.1	31.5	84.8	231.3	69.8	47.3	3.3	79.2	69.3	22.3
1936	10.1	12.8	42	4.9	.2	.5	.7	1.7	.3	9.4	.2	.2	.9	38.3	124.8	27.2	(7)	230.5	73.6	(7)	3.0	87.0	------	------
Delaware:																								
1938	12.2	15.7	53	6.2	.5	1.0	.5	6.6	1.0	11.7	(8)	(8)	.5	49.0	126.0	30.6	102.6	364.4	73.5	61.7	9.7	107.7	81.6	27.6
1937	13.7	15.9	69	5.1	2.6	1.5	(8)	8.2	.5	26.1	.5	(8)	2.0	59.9	114.7	27.1	104.5	352.9	104.0	80.4	9.2	137.8	110.6	39.4
District of Columbia:																								
1938	12.5	20.1	49	5.2	.8	.4	.6	.6	.8	5.0	.4	.6	1.7	74.0	138.3	23.2	83.6	333.5	89.3	76.2	12.2	101.7	67.2	20.6
1937	14.2	19.7	62	6.0	1.5	2.8	.6	3.4	2.1	19.4	.6	.8	5.5	92.5	142.9	27.5	98.7	328.6	130.5	78.0	11.9	93.8	81.0	26.4
1936	14.7	18.8	67	6.2	1.3	1.5	.4	7.8	4.7	8.6	.4	.9	11.2	108.3	131.6	28.9	102.3	337.1	140.3	80.9	8.6	98.2	------	------
Florida:																								
1938	12.2	17.1	59	7.7	3.3	1.9	.2	4.3	1.9	21.9	.7	.6	1.0	57.7	90.2	19.2	98.3	250.1	68.8	89.9	13.8	95.9	98.4	39.3
1937	12.2	16.4	61	6.5	3.5	.2	.1	3.5	2.5	38.9	.2	.4	4.9	58.9	92.3	17.9	103.1	231.9	65.2	88.4	11.8	99.6	103.3	39.6
1936	12.5	15.9	59	7.6	2.8	.3	.1	1.6	2.3	56.7	.6	.5	3.1	53.6	84.0	18.4	100.6	235.2	84.8	84.0	8.5	105.2	------	------
Georgia:																								
1938	10.5	19.8	70	6.6	4.4	6.1	.3	7.9	2.3	24.3	.6	.2	.8	51.4	59.9	12.6	84.1	163.8	81.8	73.4	24.2	110.7	63.8	23.5
1937	10.5	19.4	63	7.2	4.7	.2	.3	4.8	2.6	48.3	.6	.2	1.2	50.1	55.1	11.9	80.5	162.1	85.6	69.1	17.3	103.9	72.6	27.8
1936	11.7	19.6	68	7.9	6.5	.2	.4	2.2	2.9	68.7	.6	.3	2.3	56.6	54.7	11.9	79.2	175.4	119.6	74.1	17.5	105.3	------	------
Hawaii:																								
1938	7.2	19.8	57	3.8	1.4	.3	.3	4.7	.6	4.1	.6	.6	.6	58.1	52.0	15.2	51.4	117.1	64.5	50.2	11.7	54.0	53.4	15.5
1937	8.3	20.1	70	4.9	1.8	55.2	(5)	1.2	3.3	8.4	.3	(8)	.6	76.7	69.2	16.1	40.6	111.9	91.6	59.7	17.3	65.0	48.6	15.8
1936	7.9	19.9	71	3.8	2.1	(8)	(8)	.6	2.1	13.1	.3	.6	1.8	77.3	63.6	16.2	44.0	119.5	68.8	63.0	16.8	65.4	------	------
Idaho:																								
1938	9.0	22.9	42	3.6	1.9	.8	.8	3.5	.5	16.8	.3	1.3	1.9	20.8	83.4	10.7	64.7	184.5	74.6	57.0	3.7	44.9	87.2	32.4
1937	9.8	21.6	43	3.8	1.6	3.5	1.9	2.7	.8	47.2	.3	1.1	1.1	20.3	81.9	11.9	69.4	152.7	75.9	72.4	7.0	36.9	109.0	37.7
1936	10.5	20.8	45	3.4	2.2	1.9	12.4	1.9	.8	16.0	.6	1.1	6.9	26.2	76.8	13.5	73.5	181.2	98.9	66.1	5.8	25.1	------	------
Illinois:																								
1938	10.6	15.2	41	3.3	.7	3.5	1.8	1.7	1.4	5.3	.2	.4	.3	46.5	134.8	27.4	72.1	307.1	55.5	64.7	6.2	91.3	71.7	24.0
1937	11.2	14.2	45	4.1	.8	.2	2.3	2.1	2.0	20.8	1.2	.4	1.4	52.0	129.7	27.4	69.8	294.2	71.6	71.6	4.8	95.3	78.3	30.7
1936	11.9	14.0	48	4.4	.8	.2	3.5	2.0	2.4	14.0	.6	.5	2.5	52.5	131.6	29.0	79.0	314.4	78.7	72.6	6.3	103.0	------	------
Indiana:																								
1938	10.5	15.9	43	4.2	.7	4.0	1.8	1.6	1.8	11.5	.3	.6	.7	39.4	110.6	15.9	117.4	229.6	64.9	(7)	8.6	63.1	71.6	28.9
1937	11.3	14.8	53	3.8	1.3	.4	3.1	5.3	1.2	38.1	1.0	.5	1.8	46.3	108.0	14.8	118.2	242.7	92.4	(7)	9.2	63.7	85.0	37.8
1936	12.0	14.3	52	5.1	1.5	.2	3.4	1.7	2.7	30.7	.3	.7	2.1	48.8	107.9	17.2	130.6	270.0	100.3	(7)	8.4	77.4	102.9	32.5

[1] Data not compiled for these causes prior to 1937.
[2] Includes all States, except South Carolina, with data for the 9-month period of 1937 and 1938. The District of Columbia is included as a State. Estimated population July 1, 1938: 112,367,000.
[3] These data are taken from the Monthly Statistical Bulletin published by the Metropolitan Life Insurance Co. The figures are subject to correction, since they are based on provisional estimates of lives exposed to risk (17,700,000 persons in 1938). Data does not include all diseases reported to the Public Health Service.
[4] Excludes pericarditis, acute endocarditis, acute myocarditis, coronary artery diseases, and angina pectoris.
[5] Classified as diarrhea and enteritis, age not specified.
[6] Chronic nephritis (Bright's disease) only.
[7] Data not available.
[8] No deaths reported.

Provisional mortality rates from certain causes in the first 9 months of 1938, with comparative provisional data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births		Death rate per 100,000 population (annual basis)																			
			Total infant mortality	Maternal mortality	Typhoid and paratyphoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Acute poliomyelitis and polioencephalitis (16)	Encephalitis, epidemic or lethargic (17)	Epidemic cerebrospinal meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the heart (90–95)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130–132)	All accidents (176–195, 201–214)	Automobile accidents (206, 208, 210)
JANUARY—SEPTEMBER—con.																								
Iowa:																								
1938	9.3	16.3	37	3.3	0.6	1.3	2.1	2.8	0.8	12.0	0.5	1.0	0.7	19.1	125.2	21.1	96.4	237.1	56.5	56.4	3.6	55.7	63.4	16.4
1937	9.8	15.7	43	4.7	.7	.1	4.2	3.5	.3	39.0	1.6	.7	1.0	21.0	124.2	20.8	101.6	216.8	64.5	56.1	4.3	59.4	74.8	21.6
1936	10.1	16.9	41	4.1	1.2	.1	3.3	1.5	.8	19.1	.2	.4	2.0	22.4	122.8	24.6	108.0	235.0	69.5	59.6	3.8	60.9	------	------
Kansas:																								
1938	9.9	15.7	42	4.1	.9	1.7	1.5	3.1	.5	15.7	(8)	1.0	.4	23.5	120.4	23.7	96.0	228.8	48.5	62.2	5.1	95.7	101.2	22.8
1937	10.4	15.2	46	4.4	.7	.1	4.3	2.7	1.4	40.6	2.0	1.4	1.4	27.5	114.8	22.8	97.8	230.9	64.1	64.1	6.0	86.6	113.2	24.8
1936	11.8	15.6	53	6.0	1.7	.1	4.8	1.0	2.1	53.2	.7	1.1	1.3	30.7	115.7	22.5	106.1	245.6	86.8	74.2	6.4	100.8	------	------
Kentucky:																								
1938	9.1	22.2	51	4.0	3.8	4.7	1.3	7.3	2.4	21.8	.9	.2	2.2	66.6	67.7	12.6	92.0	176.3	66.2	79.9	32.6	67.0	56.1	19.7
1937	10.2	20.1	51	4.0	5.3	3.5	1.4	7.8	3.4	57.3	1.2	.6	2.9	66.6	66.2	10.3	83.1	157.4	89.0	74.5	24.7	63.9	68.7	24.4
Maine:																								
1938	11.9	17.8	49	4.3	1.9	2.0	(8)	2.3	.6	16.0	.6	.2	(8)	29.8	144.4	27.3	112.7	332.5	73.1	57.8	8.6	83.0	63.3	18.8
1937	13.4	18.5	60	5.1	1.6	.3	.5	2.8	.5	45.3	2.0	.2	.8	31.9	149.2	23.0	123.7	366.3	98.9	58.6	13.3	84.2	67.5	15.8
Maryland:																								
1938	12.3	17.4	57	3.8	1.7	.6	.6	3.3	.7	8.1	.1	1.1	1.0	79.1	134.8	29.0	100.5	319.6	81.1	63.0	12.4	130.6	72.3	21.4
1937	13.3	16.6	63	4.1	1.9	2.9	.8	6.3	1.4	19.0	1.3	1.6	3.2	86.0	132.2	27.2	110.6	308.5	111.9	72.2	15.1	140.6	92.4	29.7
1936	13.0	16.4	62	4.8	1.8	1.8	.7	4.3	1.3	11.7	(8)	1.0	8.6	82.4	127.8	27.4	112.0	301.4	110.3	66.0	10.9	141.6	------	------
Massachusetts:																								
1938	11.0	(7)	(7)	(7)	.3	.3	.7	.9	.3	3.7	.3	.2	.6	37.9	154.8	32.2	96.1	359.6	74.6	54.6	2.6	68.4	59.1	13.8
1937	11.6	(7)	(7)	(7)	.2	.8	1.0	2.3	.3	11.5	.6	.3	1.8	41.3	148.2	34.3	95.2	361.2	101.8	62.6	3.1	71.8	64.2	17.3
Michigan:																								
1938	10.3	19.8	44	3.6	.6	2.6	1.9	2.6	.8	6.3	.2	.2	.4	40.3	116.6	25.8	88.2	278.1	56.4	62.3	6.7	55.4	70.9	25.7
1937	11.2	18.6	50	3.7	.7	.2	3.4	2.9	1.2	21.6	1.2	.2	1.0	45.5	114.1	25.6	86.7	271.6	86.4	67.0	5.8	61.0	91.6	38.8
1936	11.5	18.4	50	5.0	.7	.2	2.4	2.3	.8	12.7	.4	.4	1.3	44.4	116.0	26.1	94.9	279.9	87.7	76.0	9.3	64.1	------	------

Minnesota:																								
1938	9.5	17.9	38	3.2	.4	.8	1.2	2.2	.4	8.4	.4	.8	.4	29.1	140.3	24.8	85.1	236.5	63.0	54.3	3.0	42.1	69.9	23.2
1937	10.1	18.0	42	3.0	.3	.3	1.7	2.5	.4	29.8	1.6	1.0	1.1	35.0	139.2	23.8	86.5	228.3	77.1	56.4	2.8	44.9	74.0	22.0
1936	10.9	17.2	44	4.3	.6	1.1	5.1	1.0	.4	13.9	.2	.8	1.9	36.6	130.0	26.8	86.6	242.7	81.8	64.3	5.0	48.3	------	------
Missouri:																								
1938	11.0	15.6	49	3.7	2.3	6.5	2.2	4.7	2.3	16.7	.5	.6	.5	50.0	124.3	22.5	87.2	259.9	89.4	63.3	10.6	104.0	68.7	22.1
1937	11.9	13.8	61	5.8	3.6	.4	2.9	4.4	1.9	43.5	1.4	1.0	1.3	57.6	120.9	22.9	93.7	262.7	123.6	63.0	10.5	102.5	80.5	26.2
Montana:																								
1938	10.4	19.6	42	3.6	.7	1.5	2.0	8.8	2.0	21.1	.2	5.6	2.0	44.4	97.1	15.9	87.8	212.7	76.5	67.5	6.1	40.5	103.3	23.8
1937	11.6	19.2	50	3.9	2.7	.5	2.5	2.7	2.0	68.0	1.2	.7	1.7	43.9	105.9	20.1	92.3	209.4	110.9	70.9	5.0	65.2	109.1	30.5
1936	11.6	19.6	50	5.0	1.5	.8	9.1	4.0	2.5	21.9	.2	.5	4.0	43.3	104.6	22.1	91.6	191.2	115.5	90.1	11.1	73.7	------	------
Nebraska:																								
1938	8.7	16.0	37	3.3	.5	.9	1.3	2.6	.9	11.0	.4	.8	.5	16.8	120.2	24.5	82.9	217.0	52.7	50.2	2.5	60.0	57.1	17.2
1937	9.7	16.0	43	4.2	.5	.4	3.4	2.0	1.0	52.9	3.9	1.0	1.3	20.4	111.2	26.8	86.4	216.8	62.5	63.2	4.2	64.4	66.4	23.0
1936	10.2	17.0	44	5.9	.9	1.0	6.0	1.7	1.6	21.3	.8	.5	1.4	18.4	112.5	26.8	120.7	225.3	69.8	78.4	4.6	72.4	------	------
Nevada:																								
1938	11.9	17.7	36	2.2	3.9	(8)	(8)	1.3	3.9	1.3	(8)	(8)	(8)	70.8	94.4	13.1	74.7	276.6	100.9	62.9	5.2	40.6	135.0	57.7
1937	12.6	15.0	49	8.8	(8)	(8)	2.6	2.6	(8)	11.9	(8)	(8)	(8)	74.1	71.5	11.9	82.1	242.2	127.1	58.2	4.0	41.0	166.8	56.9
New Jersey:																								
1938	9.9	13.0	39	3.4	.4	.9	.3	1.1	.7	4.8	.2	.7	.5	45.6	125.6	28.5	79.4	315.9	56.7	57.1	3.0	69.4	58.1	19.5
1937	10.2	12.6	40	3.3	.7	1.6	.4	1.2	.5	11.8	.5	.5	1.2	48.0	121.2	31.1	76.1	307.5	69.9	57.5	3.0	71.8	72.9	24.8
1936	10.2	12.4	44	3.9	.6	.4	.8	1.4	.3	7.8	.2	.8	2.0	51.0	123.0	30.6	80.3	294.8	68.9	58.4	3.6	76.5	------	------
New Mexico:																								
1938	13.1	35.5	93	4.9	3.8	15.8	1.0	17.4	3.2	14.2	1.0	(8)	.6	91.6	66.5	7.3	50.7	134.3	85.5	114.0	48.5	64.3	93.8	33.6
New York:																								
1938	11.3	14.7	41	3.8	.4	.8	.6	1.5	.3	3.7	.2	.7	.8	51.6	153.9	36.4	64.5	360.2	65.8	62.7	5.2	72.1	64.5	17.5
1937	12.0	14.6	46	4.0	.5	.6	.8	1.3	.7	11.9	.4	.7	1.3	59.7	149.8	37.5	73.9	362.2	93.3	69.1	6.3	76.8	72.3	21.7
1936	11.9	14.2	46	5.1	.6	1.3	1.7	1.0	.5	6.8	.1	.6	2.4	59.7	144.8	35.5	79.1	348.1	91.2	69.8	6.0	78.3	------	------
North Carolina:																								
1938	9.6	22.6	68	6.1	9.6	9.0	.5	8.3	3.6	13.9	.3	.4	.9	55.0	54.4	10.5	78.7	161.0	76.0	79.7	32.9	89.6	60.9	22.5
1937	9.7	22.9	65	5.4	2.6	1.3	.3	4.7	2.8	29.4	.5	.5	1.1	55.7	52.8	10.4	77.4	156.6	83.6	72.7	26.6	83.7	69.8	27.3
1936	10.3	22.4	66	6.5	2.0	.2	.5	1.1	2.9	36.9	.5	.5	1.6	61.9	50.4	11.9	(7)	(7)	106.3	(7)	22.4	(7)	------	------
North Dakota:																								
1938	7.3	18.8	47	2.5	.2	2.8	3.0	9.2	0.8	9.8	(8)	4.7	1.5	21.3	89.9	20.4	60.4	143.7	50.4	51.0	6.0	40.2	48.3	15.9
1937	8.0	18.7	53	4.6	.2	(8)	1.3	.9	.8	34.5	(8)	.8	2.3	26.1	78.0	17.2	71.0	163.6	68.7	54.2	10.0	33.7	57.6	16.5
Ohio:																								
1938	11.0	16.8	44	3.9	.8	3.5	1.3	2.1	1.1	11.4	.2	.4	.7	48.3	120.2	27.1	103.7	274.9	61.0	60.6	7.1	75.5	72.7	25.5
1937	12.0	15.6	51	4.9	1.6	1.7	1.9	5.0	1.2	34.9	1.0	1.0	1.6	52.2	119.2	26.5	108.3	282.3	86.1	70.0	9.0	79.3	96.9	36.8
1936	12.1	15.2	49	5.0	1.6	.8	2.3	2.4	1.2	20.2	.6	.9	2.3	54.0	126.2	27.6	118.4	279.1	87.7	72.2	7.6	88.5	104.6	31.2
Oklahoma:																								
1938	7.9	17.5	42	4.2	4.0	2.6	.7	8.7	4.0	16.5	1.1	.3	1.0	45.4	69.9	12.5	64.3	127.8	56.6	58.1	9.6	58.2	66.2	20.7
1937	8.7	16.2	59	8.0	4.9	1.3	1.3	2.7	2.5	48.9	2.4	.3	2.3	51.8	72.0	12.8	61.0	130.1	76.7	64.9	11.5	63.6	62.8	24.1
Oregon:																								
1938	11.3	15.9	36	3.2	.4	.4	1.0	2.1	1.0	9.0	.4	1.8	1.0	29.8	136.0	23.2	96.0	272.2	54.8	48.8	1.8	109.7	92.8	29.3
1937	12.2	15.2	42	3.8	.8	.1	1.0	2.3	.3	37.2	.6	.9	.6	35.5	120.4	22.0	105.7	278.5	67.7	53.1	1.2	106.4	91.6	31.0
Pennsylvania:																								
1938	10.4	16.4	46	3.6	.9	3.0	1.3	1.7	.9	10.0	.1	.7	.7	41.1	116.7	29.7	79.2	295.4	59.6	55.9	5.5	79.7	56.6	15.4
1937	11.2	16.0	51	4.2	1.0	.8	1.6	2.9	.9	31.1	.4	.7	1.4	47.6	116.1	30.8	78.4	298.0	77.9	56.5	6.2	85.2	62.4	20.3
1936	11.0	15.8	48	4.6	.8	.4	1.7	1.2	1.2	15.2	.2	.6	1.4	44.7	111.0	28.1	86.2	290.4	80.1	54.5	5.9	82.2	------	------

[7] Data not available.
[8] No deaths reported.

Provisional mortality rates from certain causes in the first 9 months of 1938, with comparative provisional data for the corresponding period in preceding years—Continued

State and period	All causes, rate per 1,000 population (annual basis)	Births (exclusive of stillbirths) per 1,000 population (annual basis)	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: Maternal mortality	Death rate per 100,000 population (annual basis): Typhoid and paratyphoid fever (1, 2)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Acute poliomyelitis and polioencephalitis (16)	Encephalitis, epidemic or lethargic (17)	Epidemic cerebrospinal meningitis (18)	Tuberculosis, all forms (23-32)	Cancer, all forms (45-53)	Diabetes (59)	Cerebral hemorrhage, apoplexy (82a, b)	Diseases of the heart (90-95)	Pneumonia, all forms (107-109)	Diseases of the digestive system (115-129)	Diarrhea and enteritis, under 2 years (119)	Nephritis (130-132)	All accidents (176-195, 201-214)	Automobile accidents (206, 208, 210)
JANUARY—SEPTEMBER—con.																								
Rhode Island:																								
1938	12.3	15.8	41	2.1	0.4	(8)	0.4	1.4	0.2	5.1	0.2	0.8	1.0	42.2	159.8	41.2	87.2	354.6	88.9	60.7	3.9	109.6	105.0	11.8
1937	12.4	15.2	48	3.6	.2	0.6	1.8	2.9	.4	13.7	(8)	.4	2.7	47.7	157.6	42.6	97.6	369.5	101.7	59.9	4.5	111.7	53.2	17.9
1936	11.8	15.2	48	4.0	.2	.6	1.8	1.0	.2	11.0	(8)	.4	3.5	48.6	138.5	33.3	96.1	351.1	91.8	62.8	4.5	102.2	------	------
South Carolina:																								
1938	10.6	20.1	86	8.2	6.4	9.9	.5	15.2	1.9	30.1	.6	.4	.7	48.4	52.0	11.8	89.7	181.3	82.3	42.8	13.1	87.2	59.7	22.1
1937	10.3	19.7	84	7.8	7.0	.9	.4	4.1	2.5	46.6	.6	.3	1.1	49.4	47.6	10.6	86.1	175.2	87.4	28.3	10.0	88.5	76.7	25.6
1936	10.8	19.6	82	8.2	8.5	.4	.4	3.5	2.5	54.1	.9	.1	2.9	52.1	46.6	10.2	94.0	177.6	109.4	39.8	12.9	89.5	------	------
South Dakota:																								
1938	6.7	16.7	47	3.0	1.4	.2	1.0	9.9	1.0	12.0	.4	1.2	.2	32.3	91.2	19.3	65.5	165.6	52.2	49.8	5.0	40.0	58.5	16.8
1937	9.1	16.8	53	4.4	.4	(8)	3.1	1.7	.6	48.5	.8	1.0	1.4	37.1	82.1	19.7	72.7	164.8	71.1	54.7	4.2	41.9	62.4	15.3
1936	9.2	19.1	47	4.3	2.1	.4	4.1	.6	1.0	21.8	(8)	.2	(8)	34.7	91.3	22.2	83.6	156.2	67.4	62.7	10.2	63.9	------	------
Tennessee:																								
1938	9.5	16.7	66	5.8	3.6	8.9	0.4	7.3	2.5	24.9	0.7	0.5	1.5	75.9	67.8	10.2	76.5	157.6	74.8	77.0	23.4	61.4	58.8	18.0
1937	10.2	16.7	64	6.8	4.8	1.0	.8	4.6	3.3	53.6	1.3	.6	2.6	84.0	66.0	10.7	76.8	156.2	92.0	77.0	19.8	63.9	65.9	22.6
1936	11.2	16.4	69	7.2	4.4	1.0	.7	2.4	3.0	61.7	1.4	1.0	4.2	90.2	62.4	11.6	79.0	160.8	120.0	80.7	19.9	68.3	------	------
Utah:																								
1938	9.0	25.6	42	3.7	.5	2.6	1.3	3.9	1.5	10.0	(8)	.3	1.8	22.1	87.4	18.8	51.4	228.3	57.9	60.7	2.3	51.9	93.8	35.7
1937	9.5	24.0	39	3.6	1.0	.8	1.6	3.4	1.3	27.8	1.6	1.0	1.3	21.1	92.0	20.4	54.9	228.8	63.9	68.0	2.8	56.4	89.4	33.5
Vermont:																								
1938	10.4	14.8	42	3.0	.3	4.1	.3	3.1	4.5	13.2	1.4	.3	(8)	36.0	117.8	26.3	99.8	291.0	78.6	51.3	2.4	77.2	61.0	19.0
1937	11.2	14.5	48	8.9	1.4	(8)	.3	1.0	.7	37.0	.7	(8)	.7	50.6	138.2	21.6	112.8	322.9	98.4	52.7	3.5	72.3	67.7	15.4
Virginia:																								
1938	10.4	18.8	72	5.2	2.2	4.8	.2	7.6	2.4	18.0	.3	.1	1.6	66.9	75.7	15.4	91.3	222.0	66.9	59.6	17.8	79.2	66.1	22.1
1937	10.8	18.5	66	5.1	1.9	2.9	.3	8.8	2.3	44.8	.4	.7	4.6	62.2	71.6	15.4	87.3	219.0	98.5	54.7	14.3	83.2	67.1	25.9
1936	11.3	19.2	62	5.1	2.3	1.2	.4	4.3	2.4	40.8	.4	.4	5.7	67.5	70.3	15.7	95.6	233.7	92.7	55.7	9.9	93.5	------	------

Washington:																								
1938	10.9	15.6	37	3.5	1.0	.2	.6	2.5	.7	11.5	.1	1.4	.7	43.5	135.4	23.9	109.1	274.6	66.9	59.0	2.3	66.9	81.3	26.6
1937	11.5	14.7	40	5.1	.8	1.0	1.0	1.3	1.0	29.9	.5	2.0	1.4	47.3	130.4	23.8	102.9	295.5	70.4	54.7	2.3	74.8	97.2	31.4
1936	11.7	14.2	43	5.3	.8	2.7	1.6	.7	.2	28.9	.8	2.0	1.7	50.4	132.0	24.6	103.9	272.6	70.3	65.2	2.4	75.3	------	------
Wisconsin:																								
1938	10.2	18.4	42	2.9	.2	1.5	1.3	1.8	.4	6.8	.2	.4	.3	30.9	136.9	29.0	88.0	285.5	55.0	(7)	5.1	63.4	69.1	20.6
1937	11.1	18.0	44	5.0	.4	.1	2.6	1.8	.7	50.7	1.0	.5	.8	36.0	134.3	26.0	91.3	288.6	69.0	(7)	4.5	70.6	83.4	27.5
1936	11.5	17.8	47	4.1	.4	.5	5.1	1.6	.4	14.8	(8)	.6	1.0	37.0	133.6	29.1	100.7	291.5	72.4	(7)	6.0	71.3	------	------
Wyoming:																								
1938	9.3	19.9	54	3.7	2.2	(8)	.6	16.4	1.7	16.4	(8)	.6	1.1	25.4	85.2	11.8	60.4	201.4	68.3	68.3	8.5	58.7	116.8	38.9
1937	10.9	19.2	52	3.8	.6	.6	5.1	5.1	(8)	58.6	4.0	1.7	2.8	18.8	73.4	9.1	82.5	260.0	124.6	74.5	14.2	31.3	135.4	53.5

[7] Data not available.
[8] No deaths reported.

THE PROTEIN TYROSIN REACTION

A BIOCHEMICAL DIAGNOSTIC TEST FOR MALARIA [1]

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INTRODUCTION

A diagnosis of malaria based upon the interpretation of clinical findings alone is inconclusive. The manifestations of an illness produced by a plasmodial infection, while often highly suggestive of the nature of the disease, are never pathognomonic, since they may also be associated with other pathologic conditions of entirely different etiology. For this reason it is necessary to supplement the clinical diagnosis of malaria with certain confirmatory procedures which lie in the realm of the clinical laboratory.

The microscopic demonstration of the offending plasmodium in the blood film is, of course, the most reliable criterion, but this is not always easy and may sometimes be impossible to accomplish. The positive identification of malaria pigment in phagocytes is another certain, but even more elusive, sign. The leucocytic formula may yield information of diagnostic importance, but is never pathognomonic of a malaria infection.

A number of investigators have attempted to apply the phenomenon of complement fixation to the diagnosis of malaria. The reported results, however, have been so contradictory that this procedure has never achieved clinical importance. This is probably due to the fact that a specific antigenic principle has not been available until quite recently, and laboratory workers have encountered all the pitfalls of other nonspecific complement fixation methods.

An interesting contribution to the serum diagnosis of malaria was made by Henry (*1*) in 1927, when he presented before the Congress for the Advancement of Sciences at Constantine, Algiers, his melano- and ferro-flocculation tests.

THE IMMUNITY THEORY OF HENRY

Henry advanced the theory that the "melanotic" and "yellow (ochre) ferruginous" pigments, formed in the organs of malaria patients, were active substances rather than inert deposits; that they were malarial endogens (endo-antigens) and either gave rise to the formation of endo-antibodies, or disturbed the colloidal state of the serum in such a manner as to impart to it certain flocculating peculiarities. Because true malaria pigment was difficult to obtain, he chose choroidal melanine and certain organic iron compounds as

[1] From the Division of Malaria Studies and Control, Tennessee Valley Authority, Wilson Dam, Ala.

"antigens" for his test. He regarded the attenuation or entire disappearance of the reaction in serums which were obtained during a paroxysm as being due to the fixation of the endo-antibodies already present by an overwhelming amount of new endogens produced from the massive destruction of erythrocytes during the attack. Le Bourdellès (*2*, *3*) contributed much to the development of the biologic theory of the endogens.

TECHNIQUE OF HENRY'S MELANO-REACTION

One part of serum is mixed with 4 parts of a suspension of melanin, formolized at 1:2,000, either in distilled water or in 0.3 percent saline for serums which flocculate spontaneously in a 1:5 dilution of distilled water. Serum controls and "antigen" controls are also set up. The stoppered tubes containing the various mixtures are incubated for 3 hours at 37° C., and allowed to stand for 30 minutes at room temperature, when the reaction is read macroscopically. Distinct flocculation of melanin indicates a positive reaction. Flocculation in thes erum control tube is called by the author "surfloculance" and supposedly occurs in some normal serums and nonmalarial serums.

Unfortunately, the macroscopic interpretation of the reaction is often difficult, especially in weakly positive serums, and Henry, in his later communications (*4*, *5*), strongly advocates the use of the photometer of Vernes, Bricq, and Yvonne for the quantitative evaluation of the optical density developed in the tubes during incubation. This provision limits the performance of the test to exceedingly well-equipped laboratories and thus makes it inaccessible to the general practitioner.

The melanin reagent employed as "antigen" is prepared from the choroidal melanin of the ox-eye. The lens is removed, the choroidal membrane scraped and the product mixed, together with the corpus vitreum, with distilled water which has been previously formolized in the proportion of 1:200. The opacity of this stock suspension is then adjusted so that a 1:10 dilution will correspond to an optical density of 48 to 49 photometric degrees (Vernes, Bricq, Yvonne). Henry has established the following photometric indices for his test: 1 to 12 degrees, negative; 13 to 18 degrees, doubtful; 19 to 100 degrees, positive for malaria.

The ferro-flocculation test which at first was run concurrently with the melano-reaction was abandoned by its author because of its lesser sensitivity and the difficulty of procuring uniform organic iron preparations.

Henry's immunity theory was soon assailed by a number of investigators, whose most weighty argument against it was that positive melano-reactions occurred in diseases in which neither melanotic nor iron pigments are produced, namely kala-azar (Chorine (*6*)); exanthe-

matous typhus (Tzechnowitzer et al. (*7*, *8*)); cirrhosis of Laennec (Chorine and Gillier (*9*, *10*)); cirrhosis of Hanot, hemolytic icterus, streptococcus septicemia, certain types of leprosy (Dhont (*11*)); in some cases of leukemia (Nanni (*12*)); and occasionally in syphilis and tuberculosis (Le Bourdellès et al. (*13*, *14*, *15*), Chorine (*16*), Farjot (*17*), Voigtländer (*18*)).

The specific antigenic activity of melanin and organic iron compounds has also been disproved experimentally. Adant (*19*) injected rabbits with repeated doses of choroidal melanin, but failed to demonstrate specific antibodies in their serum with the complement fixation test, using melanin as antigen.

Chorine and Gillier (*10*) attempted to immunize rabbits and guinea pigs with concentrated suspensions of choroidal melanin, as used in the Henry test, and with suspensions of melanin from a melanotic sarcoma of a horse. None of the treated animals developed a positive melano-reaction.

The same investigators injected distilled water intravenously into rabbits and produced large deposits of yellow pigment, giving the typical Prussian blue reaction, in liver and spleen. However, the melano- and ferro-flocculation reactions remained negative in all treated animals.

Sinton and Ghosh (*20*) maintain that malaria pigment, or hemozoin, differs chemically from the melanin of the skin and eye and is probably identical with hematin. It is therefore unlikely that melanin can act as a "specific" antigen in the melano-reaction.

Further arguments against the specific antigen-antibody theory of Henry have been brought forward by Chorine and Gillier (*10*): Positive serums become negative upon heating at 55° C. for 30 minutes, while true antibodies withstand a much higher temperature. Specific antibodies are adsorbed by kaolin, while the reacting substances in the Henry reaction are not. In patients inoculated with blood containing malaria parasites, for therapeutic purposes, the Henry reaction becomes positive as early as the third or fourth day after inoculation, often before the first paroxysm has been experienced, while true specific antibodies require a much longer time to develop.

THE PROTEIN THEORY

It has been previously stated that Henry had observed varying degrees of flocculation in the control tubes containing serum and formolized distilled water. This "surfloculance" usually disappeared when he substituted 0.3 percent saline for the distilled water in his test.

Trensz (*21*, *22*, *23*) reported a definite parallelism between this superflocculation in distilled water and the melano-reaction; the stronger the melano-reaction, the more intense was the flocculation in

distilled water. This observation led him to believe that both phenomena were of the same nature, and he suspected that Henry's reaction was dependent upon an instability of the serum proteins, due to an increase of the serum euglobulins. He attempted to prove his theory along experimental lines by inoculating guinea pigs, and later rabbits, with *Trypanosoma berberum* and studying the development of the melano-reaction parallel with the behavior of the serum proteins of the animals during the course of infection. He noted in these experiments an actual rise of the total proteins, due to a simultaneous increase of the serum albumin and serum globulin. The latter became modified both quantitatively and qualitatively. As the rate of globulin increased it became "unstable" and this instability was expressed in a great increase of the euglobulin fraction. Trensz considers this fact definite experimental evidence in favor of the role of the euglobulins in the mechanism of the melano-reaction.

Chorine and Prudhomme (*24*) confirmed the observations of Trensz and found that when malarial serums were diluted with distilled water in the proportion of 1:10 they presented more or less distinct flocculation. The same phenomenon was also noted by Greig, Hendry, and Van Rooyen (*25*) and Wiseman (*26*).

Chorine and Gillier (*10*) then studied the mechanism of the melano-reaction from the biochemical point of view and decided that the substance flocculating in distilled water was a protein, viz, the water insoluble euglobulin, probably associated with other substances of low-water solubility, such as cholesterol, lecithin, and uric acid. Upon further experimentation they showed that when sufficient euglobulin was added to a normal serum, it became positive with the melano-reaction and that the control tube containing serum and distilled water showed a corresponding flocculation. Such an artificial positive was indistinguishable from a positive reaction in malaria serum. From the foregoing observations the authors concluded that the melano-reaction is due to an instability of the malaria serum and that the melanin reagent merely serves as an indicator which facilitates the reading of the reaction.

The attenuation of the reaction or its entire disappearance during a paroxysm is explained by Chorine as due to a change in the molecular concentration of the serum, brought about by the liberation of sodium and potassium salts from erythrocytes destroyed during the paroxysm, in sufficient amounts to hold the euglobulins in solution, even upon dilution of the serum to 1:10 with distilled water. This statement is based upon cryoscopic measurements which he had made in malaria serums obtained during the period of apyrexia and during paroxysms. During apyrexia he found that the average Δ was 0.55° C., slightly less than the Δ of normal serums; while during the

rigor the Δ was 0.62° C., which corresponds to an elevation of the molecular concentration by about 0.2 percent NaCl, and is sufficient to hold the euglobulins in solution in the dilution employed in the Henry test. The author points out that potassium ions exert a much stronger action upon the solubility of the reacting substances in the melano-reaction than the sodium ions. Pinelli (*27*) and Andriadze (*28*) have also reported much higher potassium values in the fever stage than during apyrexia. The excess of salts is rapidly eliminated by the kidneys, which, Chorine states, accounts for the high potassium concentration in urines collected from malaria patients immediately after a paroxysm.

On the basis of the foregoing observations Chorine developed a simplified test in which he omits the melanin reagent. The serum (0.2 ml) is diluted with distilled water in a proportion of 1:10 and the initial optical density of the serum water mixture is determined with the photometer of Vernes, Bricq, and Yvonne. The mixture is then incubated at 37° C. for three hours, allowed to stand for 20 minutes at laboratory temperature, and the optical density redetermined. The difference between the initial and the final reading, expressed in photometric degrees, represents the index for the serum under examination. According to this simplified procedure Chorine has established the following indices: Serums with a photometric index up to 10 are negative; 10 to 20, doubtful; above 20 and up to 100, positive for malaria. Indices above 100 are found in kala-azar.

Trensz (*29*) suggests that the euglobulins are not only quantitatively increased, but also qualitatively altered in malaria because he has found that an excess of normal euglobulins dissolved in physiologic saline will not give a positive melano-reaction with his purified, soluble melanin, while malaria euglobulins will. He (*30*) denies the claim of Chorine and others that the melanin merely serves as an indicator in the Henry reaction and insists that it has the specific function of combining with the "qualitatively" altered euglobulins to form flocculation in the serum. He has prepared a purified, soluble choroidal melanin for which he claims higher "specificity" and stability. The technique with this soluble melanin is similar to that of Henry, except that he employs 0.3 percent ammonium chloride instead of 0.3 percent sodium chloride. The reaction may be read macroscopically, but Trensz emphatically recommends the use of the photometer of Vernes, Bricq, and Yvonne for which he has established the following indices: Serums with an index up to 30 are negative, 31 to 45 doubtful, 46 to 55 slightly positive, 56 to 300 positive for malaria.

Contrary to Trensz and in accord with Chorine, Benhamou and Gille (*31*) do not believe that the euglobulins are qualitatively altered in malaria, but that the melano-reaction is due to a quantitative in-

crease of the euglobulins in relation to a decreased albumin and cholesterol ratio.

Prudhomme (*32*) also has shown that there is no qualitative alteration of the euglobulins in malaria. If the precipitate of a superflocculating serum is removed by centrifugation and redissolved in normal saline, a positive melano-reaction will be obtained, while the supernatant serum in the centrifuge tube will no longer give the reaction. Similarly, if sufficient euglobulin from a normal serum is dissolved in saline, it too will give a positive melano-reaction.

Finally, other substances may take the place of the choroidal melanin in the Henry reaction, with more or less satisfactory results, namely, methylene blue, phenol red, methyl red (Greig, Hendry, and Van Rooyen (*25*)), carmine (Prudhomme (*33*)), the pigment from the sac of cuttle fish (Livierato, Vagliano, and Constantakato (*34*)), and even bacterial emulsions.

From the foregoing review of the literature pertaining to the mechanism of the Henry reaction in malaria, it seems apparent that it is not a reaction due to the interaction of specific antigens and antibodies, but that the underlying factor is of a biochemical nature. The reaction appears to be due to a disequilibrium of the serum proteins, characterized by an increase of the euglobulin fraction which flocculates upon dilution with distilled water or weak salt solutions. The interaction of other subtances in the serum, such as uric acid, cholesterol, and lecithin, should be negligible, because uric acid occurs in the serum in exceedingly small amounts, and cholesterol and lecithin are actually diminished in the apyretic stage of malaria when the reaction is strongest (Greig, Hendry, and Van Rooyen (*25*), Kehar (*35*), Benhamou and Gille (*31*)).

Whether the increase of the euglobulins in malaria is due to the mobilizing action of the malaria plasmodia upon the cells of the reticuloendothelial system, or whether the rate of euglobulin production is augmented by a conversion of pseudoglobulin deprived of its colloid-protective agents, cholesterol and lecithin, is yet a problem. However, it does appear that the euglobulins play the principal role in the reaction, and any other physical phenomena entering into it are characteristic for the melano-reaction only. It therefore seems justifiable to assume that a quantitative chemical estimation of the euglobulins would give equally satisfactory, or even better, results than the biologic demonstration of the reacting substances by means of arbitrary indicators, or the measurement of the degree of optical density produced by them in distilled water with an expensive photoelectric instrument.

A PROTEIN TYROSIN REACTION FOR THE DIAGNOSIS OF MALARIA

It has been the aim of the writers to devise a biochemical method for the quantitative estimation of serum euglobulin which would give results comparable with the melano-reaction of Henry and the distilled water method of Chorine, which would obviate the necessity for the use of an expensive photometer, and which would be relatively easy to perform, so that the test would be more generally accessible for the diagnosis of malaria.

To accomplish this purpose it was necessary to investigate the following pertinent questions:

(1) Is the total amount of serum euglobulin demonstrable by precipitation with distilled water, as practiced by Chorine, or is a more specific precipitating agent required for complete precipitation?

(2) Is the amount of euglobulin decreased during a malaria paroxysm?

(3) Is the tyrosin-chromogenic property of euglobulin sufficiently representative to permit its utilization in colorimetric work?

Numerous determinations on normal serums have shown that only 66 to 83 percent of the euglobulin is precipitated by dilution with distilled water. On the other hand, Howe (*36*, *37*) has demonstrated that the protein fraction precipitated by 13.5 percent sodium sulfate agrees closely with the euglobulin fraction obtained when saturated solutions of sodium chloride and carbon dioxide are used as precipitants.

The writers have found that the actual amount of euglobulin is not decreased during a malaria paroxysm, but that it is completely precipitable by 13.5 percent sodium sulfate. This fact induced them to use sodium sulfate in that concentration for the precipitation of the euglobulins in the test to be described, and enabled them to eliminate the negative reaction in serums obtained during a paroxysm, which has been such an annoying factor in the past.

It was the desire of the writers to utilize the chromogenic property of the proteins, which can be measured quantitatively against the color produced by pure tyrosin in the presence of a phenol reagent, as an index for the euglobulin concentration in a given serum. Wu (*38*) suggested the use of this reaction to determine plasma proteins, employing standard tyrosin solutions for comparison. He stated, "Since this chromogenic value is a constant for any given protein, the intensity of the color produced can be used as a measure of the amount of the same protein."

In order to gain information concerning the normal tyrosin values for serum euglobulin it was necessary to determine this chromogenic value in a large number of normal serums. It was found that the tyrosin values in over 2,500 normal serums fluctuated between

50 and 80 percent when the color from the precipitate of 0.1 ml of serum was developed in a volume of 2.0 ml and compared with the color developed from 0.04 mg of pure tyrosin in the same volume. The amount of 0.04 mg tyrosin in a volume of 2 ml was chosen as the maximum (100 percent) standard because in that concentration a readily comparable, transparent blue color is developed from which substandards, covering the entire range of normal serums, may be prepared by dilution. The use of stronger standards for abnormal serums is not advisable because the high color concentration will make comparison uncertain. High color concentrations obtained from abnormal serums may be safely diluted with water and the tyrosin value determined by multiplication with the dilution factor.

TECHNIQUE OF THE PROTEIN TYROSIN TEST

No equipment other than that found in any clinical laboratory is necessary for performing this test. The reagents employed may be purchased from clinical supply houses, and are as follows:

(1) Sodium sulfate solution, 14 percent. Dissolve 70 gm of c. p. anhydrous sodium sulfate in 300 ml of freshly distilled water, make up to 500 ml at a temperature of 37° C. This solution should be stored in an incubator at 37° C. It keeps indefinitely.

(2) 5-normal sodium hydroxide solution. Dilute saturated, carbonate-free sodium hydroxide solution to 20 percent.

(3) Tyrosin standard solution. Dissolve 200 mg of pure tyrosin (Pfanstiehl) in 1,000 ml of approximately 0.1 normal hydrochloric acid; 5 ml contains 1 mg tyrosin.

(4) Phenol reagent of Folin and Ciocalteu. Into a 1,500 ml Florence flask introduce 100 gm of sodium tungstate ($Na_2WO_4.2H_2O$), 25 gm of sodium molybdate ($Na_2MoO_4.H_2O$), 700 ml water, 50 ml 85 percent phosphoric acid, and 100 ml concentrated hydrochloric acid. Reflux gently for 10 hours. Add 150 gm lithium sulfate, 50 ml water, and a few drops of bromine. Boil the mixture for 15 minutes without condenser to remove the excess of bromine. Cool, dilute to 1,000 ml, and filter. The reagent should have no greenish tint.

Measure 3.0 ml of 14 percent sodium sulfate solution into a small test tube, 75 x 10 mm; from an accurately calibrated pipette add 0.1 ml of unheated, clear, nonhemolyzed, nonchylous serum; mix by inverting a dozen times, avoiding air bubbles; stopper the tube and place in the incubator at 37° C. for 3 hours. Centrifuge at 1,500 r. p. m. for 10 minutes; completely pipette off the supernatant fluid; wash the precipitate twice with fresh sodium sulfate solution by centrifugation;[2] dis-

[2] This is necessary in order to remove traces of albumin and pseudo-globulin that may have been caught in the precipitate or may adhere to the walls of the tube, and which will also react with the phenol reagent, giving too high readings.

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solve the washed precipitate in 1.75 ml of distilled water; and add 0.1 ml of 5-normal sodium hydroxide.

At this point prepare the stock standard by introducing into a test tube, graduated at 20 ml, 2 ml of the tyrosin solution, 5 ml of water, and 1.0 ml of 5-normal sodium hydroxide. Heat the unknown and the standard in boiling water for 10 minutes and allow to cool. Now add to the unknown 0.15 ml, and to the stock standard 1.5 ml of the phenol reagent and make up the standard to the 20 ml mark with distilled water. While the color is developing, set up a series of small test tubes, 75 x 10 mm, and mark the tubes with a wax pencil 100, 90, 80, 70, 60, 50, 40, 30, 20, and 10. Prepare the substandards in these tubes according to the following scheme:

Substandards..percent..	100	90	80	70	60	50	40	30	20	10
Stock standard.....ml..	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0.4	0.2
Water.............ml..	0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8

Compare the color intensity of the unknown with these standards; if the color of the unknown falls between two whole gradations, the color value is intermediate between the two. For example, if the unknown falls between 60 and 50, then the reading is 55.

The following precautions should be observed: All glassware must be chemically clean, but sterility is unnecessary. The serum pipettes should have fine tips, because small droplets of serum adhering to blunt tips may cause considerable errors. Serums should be clear. Hemolyzed serums give too high tyrosin values owing to their globin content; chylous serums give too low values owing to the fact that chyle interferes with the protein precipitation.

RESULTS

The writers have examined 2,941 consecutive serums with the above method, from the results of which they propose the following tyrosin indices (TI) for serum euglobulin:

TI—50 to 80.........	Normal serums.
TI—80 to 100........	Doubtful for malaria. In this range fall new malaria cases which have experienced only one paroxysm, treated cases, and a few cases of syphilis.
TI—105 and over....	Presumptively positive for malaria.

The following tabulation shows the results of these examinations and the respective tyrosin indices.

Source of serum	Examinations	Tyrosin indices
Healthy individuals	2,627	50- 80
Syphilitics, serologically positive	176	50- 80
Syphilitics, serologically positive	22	80-120
Malaria patients	116	80-280

Malaria parasites were demonstrated in each of the 116 cases of malaria at some time during the period they were under observation, but not always on the day that the tyrosin-protein determination was made.

For the purpose of comparing the relative efficiency of this test with the examination of thick blood films for the diagnosis of malaria, the protein-tyrosin test was made and a thick blood film was examined on the same day for each of the 116 cases of malaria. A tyrosin index of 105 was arbitrarily taken as the lowest reading presumptively indicative of a malaria infection.

Three of the malaria cases had experienced only one paroxysm at the time of examination. The tyrosin index was 80 and the blood film was positive for each of these cases. The remaining 113 cases of malaria had each experienced more than one paroxysm and in most instances had received chemotherapy. In this group the tyrosin index ranged from 105 to 270, and 18 patients had negative blood films. Thus, it is evident that 113 patients, or 97.4 percent, exhibited a protein-tyrosin test indicative of malaria, while at the same time 95, or 81.9 percent, had blood films which contained malaria parasites.

In the early stages of this investigation, before the technique described above had been developed, the writers attempted to express the amount of serum euglobulin in terms of the amount of sodium chloride necessary to effect solution of the precipitate produced with distilled water. During this time they examined serum from two patients with granuloma inguinale and found very high euglobulin values, much higher than for any malaria case examined. Consequently, they believe that tyrosin indices would exceed 200 in well-developed cases of this disease.

DISCUSSION

The potential clinical value of the Henry reaction, either with or without the use of indicators, has been demonstrated by numerous investigators, and the reaction is now widely used in Europe in the diagnosis of malaria and to determine the effectiveness of treatment of this disease. However, these investigators have also shown that positive reactions may occur in other pathologic conditions in which the serum protein equilibrium is disturbed. Fortunately, most of these conditions are readily differentiated from malaria by their symptomatology and by specific tests.

It appears that the Henry reaction has found little favor in this country, probably because of the difficulty with which uniformly reacting melanin reagents may be prepared, and because of the fact that photoelectric instruments, adaptable for the use of small quantities of fluids, were not available until quite recently. It was for

these reasons that the writers attempted to devise a simple method that would make the test more generally available to those interested in clinical malaria work.

In malaria the percentage of false positives has been estimated by Chorine (*39*) at between 5 and 6 percent for the melano-reaction and at 6 to 8 percent for his distilled-water test. The sensitivity of the reaction is high in malaria and has been estimated by the European workers at from 90 to 95 percent. The writers, using their protein tyrosin test, have obtained 97.4 percent positives in their limited number of known positive cases of malaria. This high sensitivity compares well with that of other nonspecific tests, such as the Wassermann and the precipitation tests for syphilis, which have become so important in the diagnosis of that disease.

The test is not intended to replace the microscopic examination of blood films for the diagnosis of malaria. However, it appears to be a valuable adjunct to the diagnosis of illnesses which present clinical manifestations of malaria and negative blood films.

Under the conditions described by the authors the reaction was never negative after more than one malaria paroxysm, and never positive in normal cases. They have not had an opportunity to study the behavior of the protein-tyrosin reaction in other pathologic conditions, except syphilis, in which the Henry reaction is said to be positive.

The value of the reaction in judging the effect in the treatment of malaria may be considerable. It gradually decreases in intensity under quinine treatment and finally disappears in from 25 to 50 days. Under atebrine treatment the test has become negative somewhat sooner, but this observation is based on the examination of a comparatively small number of cases.

The epidemiologic value of the Henry reaction has not been exhaustively studied. Trensz (*40*) has made a short epidemiologic survey in a native village in Algiers in which he compared the parasitic, serologic, and splenic indices in 156 malaria cases. He reports the following results: Parasite index 11 percent, serologic index 37 percent, spleen index 52 percent. The original macroscopic method of the Henry reaction was employed for the detemination of the serologic index. From these figures, Trensz concluded that the establishment of the spleen index is the method of choice in the epidemiology of malaria.

The writers have been handicapped in making an estimation of the clinical value of this test because of their inability to follow each case under observation for any considerable length of time. Nearly all of the malaria cases which have come under observation have been ambulant, and have been unwilling or unable to cooperate in this investigation. From their very limited experience, the writers

believe that the test may have considerable value in the differential diagnosis of cases which present clinical manifestations of malaria and blood films in which no malaria parasites can be detected. The following case histories partly justify this belief.

An adult Negro male was admitted to one of the medical units, complaining of general malaise. He had experienced a chill followed by a temperature of 104° F. No malaria parasites could be detected in repeated thick blood films. The tyrosin index was 80. Two days later the eruption of varicella appeared.

An adult white male was known to have had an acute, initial infection with *Plasmodium vivax* in September 1935. On April 8, 1936, he experienced a chill followed by fever, and on the following day his blood was found to contain *P. vivax* parasites. During the course of the next 2 months it was possible to examine his blood at frequent intervals. The results of these examinations are given below:

Date	Blood film	Tyrosin index	Date	Blood film	Tyrosin index
April 9	Positive, *P. vivax*	240	May 14	Negative	140
April 17	Positive, *P. vivax*	200	May 23	Negative	270
April 21	Negative	125	May 25	Positive, *P. vivax*	280
April 30	Negative	130	June 3	Negative	220

This patient received 1.3 grams of quinine sulfate daily for 7 days, from April 9, and 0.3 gram atebrine daily for 7 days beginning May 25. It appears from this single instance that it may be possible to predict an approaching relapse of an infection with *P. vivax* by means of this test. It will be noted that there was a gradual rise in the tyrosin index of this patient for a considerable time before parasites appeared in the thick blood film.

The intensity of the protein-tyrosin reaction may be dependent upon the species of plasmodium involved. The writers have observed the strongest reactions in *P. vivax* infections. However, under treatment the reaction tends to become negative sooner in *P. vivax* infections than in infections with *P. falciparum*.

Since the euglobulins play the fundamental role in the reaction, the ideal mode of reporting the results of the test would be, of course, in terms of milligrams of euglobulin in 100 ml of serum. To this end a tyrosin-euglobulin coefficient would have to be worked out, similar to those existing for total protein, albumin, and globulin. With the aid of such a coefficient the amount of euglobulin could be readily calculated from the tyrosin index obtained in a serum. The establishment of the tyrosin-euglobulin coefficient, however, requires a thorough biochemical investigation of the serum euglobulin, both in connection with its chromogenic property and its nitrogen content. Such an investigation is now being carried on and, upon its completion, the results will be reported.

SUMMARY

In 1927 Henry described a serodiagnostic test for malaria. This test was based on the assumption that malaria pigment is an active substance which either gives rise to the production of antibodies or imparts flocculating peculiarities to the serum of malaria patients. Other investigators have since demonstrated that choroidal melanin does not possess antigenic properties, and that the melano-flocculation reaction of Henry is due to a disequilibrium of serum proteins brought about by an increase in serum euglobulin.

It is generally advocated that a photometer be used in connection with the reading of the Henry test and its principal modifications. This instrument is expensive, and the performance of the test is thus limited to unusually well-equipped laboratories. This circumstance may account for the fact that the Henry test has not been much used in this country.

It was the aim of the writers to devise a simple, accurate, colorimetric test which would obviate the necessity for a photometer, thus making the test more generally adaptable. The technique of the method is described. The procedure is based on the fact that proteins possess a chromogenic property which can be measured quantitatively against the color produced by pure tyrosin in the presence of a phenol reagent. This chromogenic value is constant for a given protein and the intensity of the color produced can be used as a measure of the amount of the protein examined. Serum euglobulin is precipitated from the serum to be examined by the addition of 13.5 percent sodium sulfate solution, according to the method of Howe. The tyrosin chromogenic index (TI) is determined by comparison with standards prepared from pure tyrosin (Pfanstiehl).

As a result of the examination of over 2,000 normal blood serums, the writers have found that the tyrosin index for euglobulin fluctuates between 50 and 80, while that for serum from malaria patients ranges from 80 to 280, or higher. The test was found to be indicative of the presence of malaria in 97.4 percent of known malaria cases examined, as compared with 81.9 percent positive thick blood films examined at the same time.

Like the Henry test and its modifications, the test described here is non-specific, but its high sensitivity in malaria may make it a useful adjunct in the laboratory diagnosis of this disease. It may also be helpful in the differential diagnosis of other pathologic conditions characterized by an increase in serum euglobulin.

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CHRONIC ULCERATIVE CECITIS IN THE RAT [1]

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In 1936, during the course of certain liver experiments with a laboratory colony of rats in Boston, one of the authors (B. F. J.) observed the frequent occurrence in these animals of a characteristic disease. It may be described as an ulcerative cecitis associated with enlargement of the adjacent lymph nodes and with peritoneal adhesions. A striking feature of the disease is the occurrence of lymph stasis and cystic enlargement of the lymph nodes, chiefly those in the mesentery, and a chronic progressive fibrosis of the ulcerated cecum. The incidence of the disease was so high and the symptoms so serious that the results of the liver experiments were equivocal. Subsequently, a study of the disease itself was undertaken and a clear-cut pathological entity has been revealed.

The colony in which the disease was originally found was of mixed strain, including hooded, albino, and buff rats. The colony had been inbred for about 5 years, but consisted predominantly of albino types. It was derived mainly from rats produced by crossing wild rats with the albino Wistar strain. Since the discovery of this disease in a Boston colony, it has been found in two colonies of pure strain albino rats maintained at the National Institute of Health. One of these is a Wistar strain and the other a Buffalo strain. It has also been found

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in albino rats supposed to be of Wistar strain supplied by a local dealer near Washington, D. C.

The incidence of this disease in the Boston colony proved to be astonishingly high. Approximately 80 percent of 160 rats from the Boston colony showed post-mortem gross pathological changes characteristic of the disease. In other colonies an incidence varying from 10 to 50 percent has been observed. In any series of animals examined at autopsy, the incidence varies roughly with age, being low in young rats, while in older rats nearly every individual of an affected colony will be found to have lesions typical of this condition. Although no death rate data are available for any of these colonies, it appears that the mortality from this disease is not strikingly high in young and middle-aged rats.

At the present time, little can be said of the epidemiology, etiology, treatment, or prevention of the disease. Efforts to eradicate it from the Boston colony have been unsuccessful. It has caused abandonment of a number of experiments and the use of other species than rats. Studies are now in progress on the etiology of the condition. Bacteria have been isolated from lesions, but their relation to the disease is, as yet, uncertain.

In the early stages of the disease the animals are superficially normal in appearance. On careful palpation of the lower abdomen, however, a movable mass can sometimes be felt. The mass may appear tough, hard, and lumpy, or it may be soft and fluctuant. Diarrhea appears early, often alternating with bloody stools; it later subsides. Appetite is normal and normal weight is maintained in the earlier stages. At a later stage a palpable mass in the lower abdomen is generally present and the animals progressively lose weight and hair and become weak and emaciated. At this stage their coats are in poor condition and they appear and behave like sick animals. In some the abdominal tumor increases in size to such an extent that the picture of an emaciated animal with greatly distended abdomen results. Generally, the picture is less dramatic and the most common sign observed is intermittent diarrhea with bloody feces, or the appearance of fresh blood in the anal region. Leukocyte counts of a few affected animals in which the blood has been studied have ranged from 8,300 to 23,000 cells per cubic millimeter. Anemia may accompany the condition when advanced. Death is occasionally sudden, due to massive intestinal hemorrhage originating, apparently, in the diseased cecum.

Early gross changes may be characterized by serosal thickening and the appearance of ulceration of the cecum. The ulcers are at first small and shallow, but later the mucous membrane becomes extensively eroded with deep destruction of the musculature. The

lesion tends to remain confined within the limits of the cecum without notable extension into the ileum, colon, or appendix. In far-advanced cases the cecum becomes greatly distended and covered externally with peritoneal adhesions. Internally the enlarged cecum is often lined with a laminated calcified layer of necrotic material containing pigmented debris. In a few cases the cecum becomes atrophied and fibrous.

The lymph nodes in the mesentery immediately above the cecum show hyperplasia, fibrosis, and dilatation of lymph vessels and lymph sinuses. The dilatation of the lymph channels becomes so marked that the nodes often take on a cystic, honeycombed appearance. The cavity-like spaces in these nodes contain coagulated material. There is periarteritis, perilymphangitis, and not infrequently arterial thrombosis in the tissues around the nodes and in the base of the ulcers.

The inflammatory process consists of a combination of focal and diffuse chronic changes, the infiltration cells frequently showing a perivascular distribution. The infiltrating cells are lymphocytes, plasma cells, mononuclear leukocytes, and granulocytes of which a high percentage is eosinophilic. There is a large amount of granulation tissue and fibrosis. The morphology of the known granulomata is not reproduced.

The literature records but a relatively small number of diseases occurring in rats of laboratory colonies. H. H. Donaldson (*1*), in his book on the rat, mentions the following principal diseases of the laboratory rat: Pneumonia, middle ear disease, leprosy, plague, and spontaneous tumors. Jaffé (*2*), the author of the most exhaustive treatise on the diseases of laboratory animals, describes other diseases of rats and also the changes found in rats affected with diseases not specifically restricted to the rat. McCoy (*3*), gives a résumé of the diseases found in rats, based upon autopsies performed on approximately 120,000 animals in routine examination of rats for plague infection at the United States Public Health Service laboratory at San Francisco.

A careful search of the above and other literature has revealed no report of this condition. It is interesting that workers like G. W. McCoy [2] and F. C. Turner,[2] who have performed many thousands of post-mortem examinations upon wild rats in routine plague control work, and experimental pathologists who have frequently used rats in laboratory experiments, have not observed the mesenteric or intestinal lesions of this disease in the animals they examined. The late Dr. H. H. Donaldson [2] stated that he had not encountered this disease in his experience. Professor Castle,[2] in whose laboratory the Boston

[2] Personal communication.

strain of rats originated, stated that occasionally rats in breeding colonies in genetic experiments were found with large abdominal tumors (possibly the end stages of this disease) but were killed without post-mortem examination. It is impossible to estimate to what extent this disease has complicated the vast number and variety of experiments on rats in the various laboratories in this country.

Price-Jones (*4*) and others have described epidemics of Gärtner bacillus infection in colonies of rats. The clinical picture is somewhat similar to the condition described here, although these infections were epidemic and acute whereas this disease is essentially a chronic, progressive condition in which the advanced lesions are amazingly well tolerated by the rat. Pseudo-tuberculosis, a rare disease in the laboratory rat, possesses some features similar to this disease. Fortunately the clinical and pathological features of this disease are so distinctive that differentiation from pseudo-tuberculosis is not difficult.

This rat disease is also of particular interest because of the resemblance it bears in certain points to an intestinal affection of human beings, often designated as regional enteritis or Crohn's disease. At a later date it is planned to compare these two conditions in more detail in connection with a study of the gross and microscopic pathology of rat cecitis. The results of bacteriological studies now in progress will be reported later.

SUMMARY

A brief description is presented of a spontaneous disease of rats characterized by chronic ulcerative cecitis and chronic lymphangitis, lymphedema, and lymphoid hyperplasia of the lymph nodes of the mesentery.

ACKNOWLEDGMENT

Acknowledgment is due to Dr. George Van Siclen Smith, of the Fearing Laboratory, Free Hospital for Women, Brookline, Mass. Dr. Smith placed his colony of rats at the disposal of one of the authors for experiments, in the course of which the disease was observed. He has kindly supplied us with material for the pathological studies. This disease had been previously observed by Dr. Smith who was of the opinion that it had prevailed in his colony for the past 4 or 5 years.

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REPORT ON MARKET-MILK SUPPLIES OF CERTAIN URBAN COMMUNITIES

Compliance of the Market-Milk Supplies of Certain Urban Communities With the Grade A Pasteurized and Grade A Raw Milk Requirements of the Public Health Service Milk Ordinance and Code, as Shown by Compliance (Not Safety) Ratings of 90 Percent or More Reported by the State Milk-Sanitation Authorities During the Period January 1, 1937, to December 31, 1938

The accompanying list gives the eleventh semiannual revision of the list of certain urban communities in which the pasteurized market milk is both produced and pasteurized in accordance with the Grade A pasteurized milk requirements of the Public Health Service Milk Ordinance and Code and in which the raw market milk sold to the final consumer is produced in accordance with the Grade A raw milk requirements of said ordinance and code, as shown by ratings of 90 percent or more reported by State milk-sanitation authorities.

These ratings are not a complete measure of safety but represent the degree of compliance with the Grade A requirements of the Public Health Service Milk Ordinance and Code. Safety estimates should also take into account the percentage of milk pasteurized, which is given in the following tables.

The primary reason for publishing such lists from time to time is to encourage the communities of the United States to attain and maintain a high level of excellence in the public health control of milk supplies.

It is emphasized that the Public Health Service does not intend to imply that only those communities on the list are provided with high-grade milk supplies. Some communities which have high-grade milk supplies are not included because arrangements have not been made for the determination of their ratings by the State milk-sanitation authority. In other cases the ratings which have been determined are now more than 2 years old and have therefore lapsed. In still other communities with high-grade milk supplies there seems, in the opinion of the community, to be no local necessity nor desire for rating or inclusion in the list, nor any reasonable local benefit to be derived therefrom.

The rules under which a community is included in this list are as follows:

(1) All ratings must have been determined by the State milk-sanitation authority in accordance with the Public Health Service rating method, based upon the Grade A pasteurized milk and the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code.

(2) No community will be included in the list unless both its pasteurized milk and its raw milk ratings are 90 percent or more,

provided that communities in which only raw milk is sold will be included if the raw milk ratings are 90 percent or more.

(3) The rating used will be the latest rating submitted to the Public Health Service, but no rating will be used which is more than 2 years old.

(4) The Public Health Service will make occasional surprise check surveys of cities for which ratings of 90 percent or more have been reported by the State. If such surprise check rating is less than 90 percent but not less than 85, the city will be removed from the 90-percent list after 6 months unless a resurvey submitted by the State during this probationary interim shows a rating of 90 percent or more. If, however, such surprise check rating is less than 85 percent, the city will be removed from the list immediately.

Communities are urgently advised to bring their ordinances up to date at least every 5 years, since ratings will be made on the basis of later editions if those adopted locally are more than 5 years old.

Communities which are not now on the list and desire to be rated should request the State milk-sanitation authority to determine their ratings and, if necessary, should improve their status sufficiently to merit inclusion in the list.

Communities which are now on the list should not permit their ratings to lapse, as ratings more than 2 years old cannot be used.

Communities which have not adopted the Public Health Service Milk Ordinance may wish to give thoughtful consideration to the advisability of doing so. It is obviously easier to satisfy the requirements upon which the rating method is based if these are included in the local legislation.

Communities which are enforcing the Public Health Service Milk Ordinance, but which have not yet been admitted to the list, should determine whether this has been the result of failure to enforce the ordinance strictly or failure to bring the ordinance up to date.

State milk-sanitation authorities which are not now equipped to determine municipal ratings are urged, in fairness to their communities, to equip themselves as soon as possible. The personnel required is small, as in most States one milk specialist is sufficient for the work.

The inclusion of a community in this list means that the pasteurized milk sold in the community, if any, is of such a degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for Grade A pasteurized milk is 90 percent or more and that, similarly, the raw milk sold in the community, if any, so nearly meets the requirements that the weighted average of the percentages of compliance with the various items of sanitation required for Grade A raw milk is 90 percent or more. However, high-grade pasteurized milk is safer than high-grade raw

milk, because of the added protection of pasteurization. To secure this added protection, those who are dependent on raw milk can pasteurize the milk at home in the following simple manner: Heat the milk over a hot flame to 155° F., stirring constantly; then immediately place the vessel in cold water and continue stirring until cool.

TABLE 1.—*Communities in which all market milk is pasteurized. In these communities market milk complies with the Grade A pasteurized milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized milk ratings of 90 percent or more* [1]

Community	Percentage of milk pasteurized	Date of rating	Community	Percentage of milk pasteurized	Date of rating
ILLINOIS			MINNESOTA—con.		
Elgin	100	Dec. 14, 1938.	Winona	100	Aug. 12, 1938.
Evanston	100	May 10, 1938.			
Glencoe	100	May 13, 1938.	MISSOURI		
Highland Park	100	Do.			
Kenilworth	100	Do.	St. Louis	100	June 1938.
Lake Bluff	100	Do.			
Lake Forest	100	Do.	NORTH CAROLINA		
Waukegan	100	May 16, 1938.			
Winnetka	100	May 13, 1938.	Andrews	100	Sept. 26, 1938.
			Clinton	100	July 27, 1938.
MINNESTOA			Draper	100	Aug. 17, 1938.
			Fort Bragg	100	July 27, 1938.
Albert Lea	100	Sept. 29, 1938.	Tarboro	100	Nov. 1, 1938.
Rochester	100	October 1938.			

[1] Note particularly the percentage of milk pasteurized in the various communities listed in these tables. This percentage is an important factor to consider in estimating the safety of a city's milk supply.

TABLE 2.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw milk ratings, respectively, of 90 percent or more* [1]

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed See text for home method]

Community	Percentage of milk pasteurized	Date of rating	Community	Percentage of milk pasteurized	Date of rating
ALABAMA			FLORIDA—continued		
Dothan	49	June 21, 1938.	Miami	93	May 12, 1938.
Huntsville	80	Dec. 7, 1938.	Miami Beach	93	Do.
Montgomery	25	May 28, 1938.	Pensacola	20	June 9, 1938.
			Perry	39	June 21, 1938.
ARKANSAS			Pompano	68	Mar. 17, 1938.
El Dorado	40	June 1938.	ILLINOIS		
Fayetteville	62	November 1938.			
Fort Smith	34	Do.	Chicago	99.7	Jan. 22, 1937.
Little Rock	44	October 1938.			
Pine Bluff	27	June 1938.	KANSAS		
Texarkana	35	September 1938.			
			Eldorado	25	April 1938.
FLORIDA			Kansas City	51	December 1938.
			Lawrence	61	January 1938.
Coral Gables	93	May 12, 1938.	Leavenworth	77	December 1938.
Fort Lauderdale	68	Mar. 17, 1938.	Ottawa	13	January 1938.
Hollywood	68	Do.	Parsons	45	March 1938.

[1] Note particularly the percentage of milk pasteurized in the various communities listed in these tables. This percentage is an important factor to consider in estimating the safety of a city's milk supply.

Table 2.—*Communities in which some market milk is pasteurized. In these communities the pasteurized market milk complies with the Grade A pasteurized milk requirements and the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by pasteurized and raw milk ratings, respectively, of 90 percent or more*—Continued

Community	Percentage of milk pasteurized	Date of rating	Community	Percentage of milk pasteurized	Date of rating
KANSAS—continued			OHIO		
Salina	58	January 1938.	Athens	84	Oct. 6, 1938.
Topeka	48	December 1937.	OKLAHOMA		
Wichita	69	November 1937.	Ada	62	Sept. 16, 1938.
KENTUCKY			Bartlesville	42	Dec. 20, 1937.
Louisville	97	July 1938.	Blackwell	34	May 10, 1938.
MINNESOTA			Muskogee	70	Mar. 16, 1938.
Austin	77	May 19, 1938.	Okmulgee	55	Apr. 20, 1938.
Little Falls	64	Dec. 1, 1937.	Tulsa	77	Sept. 19, 1938.
MISSISSIPPI			OREGON		
Greenville	59	Dec. 22, 1937.	Astoria	65	July 16, 1938.
Tupelo	28	Oct. 19, 1937.	Portland	80	July 2, 1938.
MISSOURI			TENNESSEE		
Clayton	99.9	June 1938.	Clinton	75	June 9, 1938.
Ferguson	80	Do.	Knoxville	69	Apr. 16, 1937.
Kirkwood	94	Do.	Memphis	84	June 3, 1937.
University City	99.6	Do.	TEXAS		
Webster Groves	93	Do.	Amarillo	73	Oct. 17, 1938.
NEW MEXICO			Big Spring	34	Sept. 20, 1938.
Albuquerque	71	Nov. 10, 1938.	Dallas	77	Dec. 10, 1938.
Deming	12	October 1937.	Midland	51	Mar. 23, 1937.
Las Vegas	56	July 20, 1938.	San Antonio	79	Sept. 9, 1938.
NORTH CAROLINA			Seguin	12	July 30, 1938.
Asheville	67	June 23, 1938.	Texarkana	26	Oct. 25, 1938.
Burlington	87	Jan. 1, 1938.	UTAH		
Charlotte	34	June 10, 1937.	Salt Lake City	96	Mar. 31, 1938.
Durham	89	Apr. 3, 1937.	VIRGINIA		
Elizabethtown	65	Sept. 1, 1937.	Pulaski	33	July 6, 1938.
Fayetteville	49	July 27, 1938.	South Boston	77	July 11, 1938.
Franklin	73	Sept. 29, 1938.	Williamsburg	42	Sept. 28, 1938.
Goldsboro	39	Apr. 18, 1938.	WASHINGTON		
Greensboro	75	October 1938.	Camas	6	May 12, 1938.
Hendersonville	53	Sept. 13, 1938.	Vancouver	20	Do.
High Point	85	December 1937.	Walla Walla	49	November 1937.
Hope Mills	64	July 27, 1938.	WEST VIRGINIA		
Leaksville	53	Aug. 16, 1938.	Huntington	65	Dec. 16, 1937.
Lexington	60	Dec. 8, 1938.	WYOMING		
Mount Airy	47	Oct. 18, 1938.	Casper	71	Aug. 17, 1938.
Pilot Mountain	54	Oct. 19, 1938.	Cheyenne	74	July 7, 1938.
Reidsville	69	Aug. 18, 1938.			
Rocky Mount	50	Nov. 29, 1938.			
Salisbury	57	Oct. 6, 1938.			
Winston-Salem	61	November 1938.			

TABLE 3.—*Communities in which no market milk is pasteurized, but in which the raw market milk complies with the Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code to the extent shown by raw milk ratings of 90 percent or more* [1]

[NOTE.—All milk should be pasteurized or boiled, either commercially or at home, before it is consumed. See text for home method]

Community	Date of rating	Community	Date of rating
KANSAS		NORTH CAROLINA—continued	
Horton	January 1938.	Roxobel	Nov. 8, 1938.
MISSISSIPPI		Spray	Aug. 17, 1938.
		Tabor City	Mar. 30, 1938.
Brookhaven	May 31, 1937.	Wilkesboro	July 29, 1938.
Durant	June 9, 1937.	Windsor	Nov. 8, 1938.
Leland	Dec. 22, 1937.	Winton	June 25, 1937.
Ocean Springs	Dec. 29, 1937.	Woodville	Nov. 8, 1938.
Yazoo City	June 8, 1937.	OKLAHOMA	
NEW MEXICO		Hobart	Jan. 19, 1938.
Raton	Dec. 21, 1937.	Kingfisher	Nov. 22, 1937
NORTH CAROLINA		SOUTH CAROLINA	
Ahoskie	Oct. 20, 1938.	Hartsville	Mar. 30, 1938.
Aulander	Nov. 8, 1938.	TENNESSEE	
Belhaven	Oct. 26, 1938.		
Bladenboro	Sept. 1, 1937.		
Clarkton	Do.	Knox County	June 7, 1938.
Colerain	Nov. 8, 1938.	Ripley	May 13, 1938.
Edenton	Nov. 7, 1938.	Savannah	Apr. 22, 1938.
Elkin	Oct. 19, 1938.	TEXAS	
Fremont	Feb. 2, 1938.	Canyon	Oct. 14, 1938.
Kelford	Nov. 8, 1938.	Colorado	Mar. 19, 1937.
Lewiston	Do.	Del Rio	June 8, 1937.
Mount Holly	Oct. 28, 1937.	Kermit	Sept. 12, 1938.
Mount Olive	Feb. 2, 1938.		
Murfreesboro	Oct. 20, 1938.	VIRGINIA	
North Wilkesboro	July 29, 1938.		
Powellsville	Nov. 8, 1938.	Boydton	July 20, 1938.

[1] Note particularly the percentage of milk pasteurized in the various communities listed in these tables This percentage is an important factor to consider in estimating the safety of a city's milk supply.

ESTIMATED POPULATION OF CONTINENTAL UNITED STATES AND OUTLYING TERRITORIES AND POSSESSIONS, JULY 1, 1938

In view of the interest of health officers, and students of demography and vital statistics, in the population of the United States and the individual States, there are printed here some statements and tables recently issued by the Bureau of the Census.

The Public Health Service is frequently requested to furnish specific case and death rates for the country as a whole as well as for individual States and cities, and there is some hesitancy in computing such rates without authoritative estimates of populations. The Census Bureau has not made public population estimates for cities since 1933, and the last estimates to be made for States before the next decennial census in 1940 are those for July 1, 1937, which are printed herewith. Persons having need for estimates of population of the United States, of geographic divisions, and of individual States for the intervening years may compute them by the method deemed most applicable on

the basis of the figures printed here and the consideration of any other demographic factors which may present themselves.

The following statements and tables are taken from a report of the Bureau of the Census dated November 16, 1938:

The population of continental United States on July 1, 1938, was 130,215,000, according to a preliminary estimate of the Bureau of the Census. This estimate represents an increase of 958,000, or 0.7 of 1 percent, over the 1937 estimate of 129,257,000. It is based on the number of births and deaths during the year ending June 30, 1938, and the excess of immigration over emigration. The excess of births over deaths (including an allowance for under-registration in both cases) was approximately 916,000; the net immigration increase was approximately 43,000.

The fact that the population of the United States has passed the 130,000,000 mark possesses a peculiar significance because of the rapidly decreasing rate of growth of the population of this country. In the decade from 1880 to 1890, the population of the United States increased 25.5 percent, or at a rate of 2.3 percent [1] per year; four decades later, in the period from 1920 to 1930, the population increased by 15.7 percent, or at a rate of 1.5 percent [1] per year. During the 8-year period following the 1930 census, however, the average annual rate of growth was less than half that of the decade 1920 to 1930. During these 8 years, the population of the United States increased at a rate of only 0.7 percent [1] per year. This marked decrease in the rate of population growth is attributable, on the one hand, to the declining birth rate and, on the other, to the decrease in net immigration which, during the past 8 years, has resulted, for the first time in the history of this Nation, in a net loss of population to foreign countries.

The estimated population of the United States from January 1, 1930, through July 1, 1938, is shown by 6-month intervals in table 1.

There is practically no phase of modern life which is not affected by decreasing population growth and its attendant changes in the composition of the population. To the businessman and manufacturer, the marked decrease in the rate of population growth foreshadows a contraction in expectations for future markets at home and points to the increased importance of foreign trade. To educators, the decreasing rate of population growth indicates smaller need for expansion of school plant and personnel and possible expansion of adult educational facilities. To the welfare agencies, the decline in

[1] This is the geometric mean annual rate of growth, which assumes that the population increased at a constant rate during the given period. It is computed from the formula: $P_n = P_o (1+r)^n$. In which:

P_o = population at beginning of period.

P_n = population after n years.

r = rate of change per year, or geometric mean annual rate of change.

population growth indicates an increasing proportion of aged persons in the population of the United States which may augment welfare problems. The declining proportion of young persons and increasing proportion in the older age groups will, of course, have other effects and will probably call for readjustments in such varied types of activity as the manufacture of infants' clothing, toys, wheel chairs, and other commodities, and in medical services, recreation, labor policies, and pensions.

TABLE 1.—*Estimated population of the United States, Jan. 1, 1930, to July 1, 1938*

Date	Estimated population	Increase in preceding 6 months		Increase in preceding year		Increase over 1930 census [a]		
		Amount	Percent	Amount	Percent	Amount	Percent	Ratio to 1920-30 increase
July 1, 1938	130, 215, 000	397, 000	0. 31	958, 000	0. 74	7, 440, 000	6. 06	0. 43599
Jan. 1, 1938	129, 818, 000	561, 000	. 43	941, 000	. 73	7, 043, 000	5. 74	. 41273
July 1, 1937	129, 257, 000	380, 000	. 29	828, 000	. 64	6, 482, 000	5. 28	. 37985
Jan. 1, 1937	128, 877, 000	448, 000	. 35	853, 000	. 67	6, 102, 000	4. 97	. 35759
July 1, 1936	128, 429, 000	405, 000	. 32	908, 000	. 71	5, 654, 000	4. 61	. 33133
Jan. 1, 1936	128, 024, 000	503, 000	. 39	872, 000	. 69	5, 249, 000	4. 28	. 30760
July 1, 1935	127, 521, 000	369, 000	. 29	895, 000	. 71	4, 746, 000	3. 87	. 27812
Jan. 1, 1935	127, 152, 000	526, 000	. 42	918, 000	. 73	4, 377, 000	3. 57	. 25650
July 1, 1934	126, 626, 000	392, 000	. 31	856, 000	. 68	3, 851, 000	3. 14	. 22567
Jan. 1, 1934	126, 234, 000	464, 000	. 37	847, 000	. 68	3, 459, 000	2. 82	. 20270
July 1, 1933	125, 770, 000	383, 000	. 31	796, 000	. 64	2, 995, 000	2. 44	. 17551
Jan. 1, 1933	125, 387, 000	413, 000	. 33	808, 000	. 65	2, 612, 000	2. 13	. 15307
July 1, 1932	124, 974, 000	395, 000	. 32	861, 000	. 69	2, 199, 000	1. 79	. 12886
Jan. 1, 1932	124, 579, 000	466, 000	. 38	892, 000	. 72	1, 804, 000	1. 47	. 10571
July 1, 1931	124, 113, 000	426, 000	. 34	1, 022, 000	. 83	1, 338, 000	1. 09	. 07841
Jan. 1, 1931	123, 687, 000	596, 000	. 48	1, 190, 000	. 97	912, 000	. 74	. 05344
July 1, 1930	123, 091, 000	594, 000	. 48	----------	-----	316, 000	. 26	. 01852
Jan. 1, 1930	122, 497, 000	----------	-----	----------	-----	----------	-----	-------

[a] The population at the 1930 census (Apr. 1) was 122.775,046; the increase from 1920 (Jan. 1) to 1930 was 17,064,426.

Analysis of the growth of population during this period, as shown in table 1, reveals that the rate of growth was greatest during the year preceding January 1, 1931, when it reached 0.97 percent, or an increase of 1,190,000 persons. This is attributable to the fact that the greatest natural increase occurred during that year; that is, the greatest excess of births over deaths. The number of deaths during that year decreased with the onset of the depression, while the effect of the economic slump, as might be expected, was not reflected in a decreased birth rate until the following year. The lowest annual increase during this 8-year period occurred in the year ending July 1, 1933, in which year the population of the United States increased by only 796,000 persons, or 0.64 percent. This relatively small increase was due not only to the relatively small excess of births over deaths, but also to the fact that 129,000 more persons departed from the

country than entered it during that fiscal year. It is significant that there was an excess of emigrants over immigrants in the years 1931 through 1934, and relatively small net immigration in the years following. During the entire 8-year period, the United States lost approximately 190,000 persons in its exchange of population with other lands.

The Bureau of the Census bases its estimates of the population of continental United States on the annual excess of births over deaths and on the net immigration. The sources of the estimated increase of the population of the United States for 6-month intervals since January 1, 1930, are presented in table 2.

TABLE 2.—*Sources of the estimated increase in the population of the United States, by 6-month periods, 1930–38*

Period	Estimated increase	Excess of births over deaths	Net immigration [1]	Births [2]	Deaths [2]
Total, 8¼ years	7,440,000	7,631,037	−189,706	19,456,103	11,825,066
January-June 1938	397,000	387,440	+9,721	1,176,620	789,180
July-December 1937	561,000	528,417	+33,023	1,224,306	695,889
January-June 1937	380,000	371,231	+9,470	1,172,496	801,265
July-December 1936	448,000	446,453	+1,034	1,170,132	723,679
January-June 1936	405,000	396,899	+8,101	1,109,033	712,134
July-December 1935	503,000	503,057	−57	1,183,254	680,197
January-June 1935	369,000	359,629	+9,579	1,108,184	748,555
July-December 1934	526,000	529,549	−3,728	1,216,010	686,461
January-June 1934	392,000	389,155	+3,054	1,142,800	753,645
July-December 1933	464,000	462,470	+982	1,126,546	664,076
January-June 1933	383,000	415,414	−31,790	1,134,952	719,538
July-December 1932	413,000	509,899	−97,238	1,180,645	670,746
January-June 1932	395,000	466,450	−71,458	1,192,126	725,676
July-December 1931	466,000	555,733	−89,254	1,208,573	652,840
January-June 1931	426,000	465,196	−39,209	1,221,711	756,515
July-December, 1930	596,000	575,523	+20,528	1,255,596	660,073
Apr. 1 [3] to June 30, 1930	316,000	268,522	+47,536	633,119	364,597

[1] A minus sign (−) indicates net emigration or an excess of departures over arrivals. The figures for net immigration are based upon the arrivals and departures of both aliens and citizens, and differ from those published by the Bureau of Immigration and Naturalization, since they relate only to continental United States and therefore exclude the movement of population between foreign countries and the outlying territories and possessions and include the net migration between the outlying possessions and the mainland.

[2] Including allowance for under-registration.

[3] From Jan. 1 to Apr. 1, 1930, the date of the census, the estimated increase was 278,000. This figure resulted from excess births of 256,072, and net immigration, 22,260; the estimated number of births was 643,395, and deaths, 387,323.

Because of the lack of adequate data on internal migration, and because of the proximity of the Sixteenth Decennial Census of Population, to be taken in 1940, the Census Bureau will issue no further estimates of the population of the States during this intercensal decade. The last estimates of the population of the States are, therefore, those released as of July 1, 1937 (table 3). Moreover, because of the inadequacies of the data available for population estimates, no further estimates of the total population of the United States will be released during this decade.

TABLE 3.—*Estimated population as of July 1, 1937, by States and Geographic Divisions*

Division and State	Estimated population
UNITED STATES	129,257,000
NEW ENGLAND	8,597,000
Maine	856,000
New Hampshire	510,000
Vermont	383,000
Massachusetts	4,426,000
Rhode Island	681,000
Connecticut	1,741,000
MIDDLE ATLANTIC	27,478,000
New York	12,959,000
New Jersey	4,343,000
Pennsylvania	10,176,000
EAST NORTH CENTRAL	25,841,000
Ohio	6,733,000
Indiana	3,474,000
Illinois	7,878,000
Michigan	4,830,000
Wisconsin	2,926,000
WEST NORTH CENTRAL	13,819,000
Minnesota	2,652,000
Iowa	2,552,000
Missouri	3,989,000
North Dakota	706,000
South Dakota	692,000
Nebraska	1,364,000
Kansas	1,864,000
SOUTH ATLANTIC	17,260,000
Delaware	261,000
Maryland	1,679,000
District of Columbia	627,000
SOUTH ATLANTIC—Continued.	
Virginia	2,706,000
West Virginia	1,865,000
North Carolina	3,492,000
South Carolina	1,875,000
Georgia	3,085,000
Florida	1,670,000
EAST SOUTH CENTRAL	10,731,000
Kentucky	2,920,000
Tennessee	2,893,000
Alabama	2,895,000
Mississippi	2,023,000
WEST SOUTH CENTRAL	12,900,000
Arkansas	2,048,000
Louisiana	2,132,000
Oklahoma	2,548,000
Texas	6,172,000
MOUNTAIN	3,792,000
Montana	539,000
Idaho	493,000
Wyoming	235,000
Colorado	1,071,000
New Mexico	422,000
Arizona	412,000
Utah	519,000
Nevada	101,000
PACIFIC	8,839,000
Washington	1,658,000
Oregon	1,027,000
California	6,154,000

TABLE 4.—*Estimated population of outlying territories and possessions as of July 1, 1930–38*

Date	Alaska	Hawaii	Puerto Rico [1]	Panama Canal Zone	Virgin Islands [2]	Guam	Samoa
July 1, 1938	62,700	405,000	1,806,000	52,800	22,000	22,700	11,700
July 1, 1937	62,200	399,000	1,774,000	51,000	22,000	22,200	11,500
July 1, 1936	62,000	392,500	1,742,000	50,000	22,000	21,700	11,300
July 1, 1935	61,500	386,200	1,710,300	48,000	22,000	21,200	11,100
July 1, 1934	61,000	382,000	1,678,600	46,300	22,000	20,700	10,900
July 1, 1933	60,600	382,000	1,647,000	44,700	22,000	20,200	10,700
July 1, 1932	60,200	383,600	1,615,400	43,100	22,000	19,700	10,500
July 1, 1931	59,800	377,000	1,583,700	41,500	22,000	19,100	10,300
July 1, 1930	59,400	368,000	1,552,000	39,900	22,000	18,600	10,100
Census, 1930 [3]	59,278	368,336	1,543,913	39,467	22,012	18,509	10,055

[1] As enumerated at a special census Dec. 1, 1935, the population was 1,723,534.
[2] No estimate made. Figures are for census population, Apr. 1, 1930.
[3] As of Apr. 1, except in Alaska where because of unusual climatic conditions the census was taken as of Oct. 1, 1929.

Estimates of the population of outlying territories and possessions on July 1, 1938, have also been prepared by the Bureau of the Census. These are presented in table 4, which shows also the estimated population of the outlying territories and possessions for the years subsequent to 1930.

For Alaska, the Panama Canal Zone, Guam, and American Samoa, the estimates were obtained by extrapolation of the increase between the censuses of 1920 and 1930. The 1930 census figures were used for

Virgin Islands instead of projecting the decrease shown in the period 1920–30. For Hawaii the estimates were based on natural increase and immigration since 1930. The estimates for Puerto Rico were made on the basis of a special census taken as of December 1, 1935, on which date the population was 1,723,534.

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period July–December 1938

There is printed herewith a list of publications of the United States Public Health Service issued during the period July–December 1938.

The most important articles that appear each week in the PUBLIC HEALTH REPORTS are reprinted in pamphlet form, making possible a wider and more economical distribution of information that is of especial value and interest to public health workers and the general public.

All of the publications listed below except those marked with an asterisk (*) are available for free distribution and as long as the supply lasts may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D. C. Those publications marked with an asterisk are not available for free distribution, but, unless stated to be "out of print," may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., *at the prices noted.* (No remittances should be sent to the Public Health Service.)

Periodicals

*Public Health Reports (weekly), July–December, vol. 53, nos. 26 to 52, pages 1065 to 2309. 5 cents a number.

*Venereal Disease Information (monthly), July–December, vol. 19, nos. 7 to 12, pages 208 to 438. 5 cents a number.

Reprints From the Public Health Reports

1953. Metal fume fever and its prevention. By R. R. Sayers. July 1, 1938. 6 pages.

1954. Studies on trichinosis. VI. Epidemiological aspects of trichinosis in the United States as indicated by an examination of 1,000 diaphragms for trichinae. By Maurice C. Hall. July 1, 1938. 20 pages.

1955. Mortality during periods of excessive temperature. By Mary Gover. July 8, 1938. 22 pages.

1956. Directory of whole-time county health officers, 1938. July 8, 1938. 20 pages.

1957. The relative amount of ill-health in rural and urban communities. By Harold F. Dorn. July 15, 1938. 16 pages.

1958. Studies on the fate of selenium in the organism. By M. I. Smith, B. B. Westfall, and E. F. Stohlman. July 15, 1938. 18 pages.

1959. Two new species of Meringis jordan (Siphonaptera). By Glen M. Kohls. July 15, 1938. 5 pages.

1960. The absorption and excretion of lead arsenate in man. By Lawrence T. Fairhall and Paul A. Neal. July 22, 1938. 15 pages.

1961. The persistence of the viruses of endemic (murine) typhus, Rocky Mountain spotted fever, and boutonneuse fever in tissues of experimental animals. By Cornelius B. Philip and R. R. Parker. July 22, 1938. 6 pages.

1962. Endemic typhus virus in mice. By George D. Brigham. July 22, 1938. 6 pages.

1963. Frequency and duration of disabilities causing absence from work among the employees of a public utility, 1933–1937. By William M. Gafafer and Elizabeth S. Frasier. July 29, 1938. 16 pages.

1964. Antagonism between species of malaria parasites in induced mixed infections. Preliminary note. By Bruce Mayne and Martin D. Young. July 29, 1938. 3 pages.

1965. Toxicology of phenyldichlorarsine. II. Response of man to PDA-oil mixtures. By R. R. Sayers and H. C. Dudley. July 29, 1938. 10 pages; 3 plates.

1966. Public Health Service publications. A list of publications issued during the period January-June 1938. July 29, 1938. 5 pages.

1967. A case of human infection with B. pseudotuberculosis rodentium. By Norman H. Topping, C. E. Watts, and R. D. Lillie. August 5, 1938. 13 pages; 2 plates.

1968. Studies on dental caries. V. Familial resemblance in the caries experience of siblings. By Henry Klein and Carroll E. Palmer. August 5, 1938. 12 pages.

1969. Report on market-milk supplies of certain urban communities. Compliance of the market-milk supplies of certain urban communities with the Grade A pasteurized and Grade A raw milk requirements of the Public Health Service Milk Ordinance and Code (as shown by compliance (not safety) ratings of 90 percent or more reported by the State milk-sanitation authorities during the period July 1, 1936, to June 30, 1938). August 12, 1938. 5 pages.

1970. Methods of making sanitation ratings of milk sheds. By Leslie C. Frank, Abraham W. Fuchs, and Walter N. Dashiell. August 12, 1938. 14 pages.

1971. A comparison of the precipitation reaction in immune serum agar plates with the protection of mice by antimeningococcus serum. By Margaret Pittman, Sara E. Branham, and Elsie M. Sockrider. August 12, 1938. 9 pages; 1 plate.

1972. State and insular health authorities, 1938. Directory, with data as to appropriations and publications. August 12, 1938. 21 pages.

1973. Endemic fluorosis and its relation to dental caries. By H. Trendley Dean. August 19, 1938. 10 pages; 1 plate.

1974. Silicosis and similar dust diseases. Medical aspects and control. By R. R. Sayers and R. R. Jones. August 19, 1938. 20 pages.

1975. Studies on trichinosis. VII. The past and present status of trichinosis in the United States, and the indicated control measures. By Maurice C. Hall. August 19, 1938. 14 pages.

1976. The flora and fauna of surface waters polluted by acid mine drainage. By James B. Lackey. August 26, 1938. 9 pages.

1977. Studies on chronic brucellosis. IV. An evaluation of the diagnostic laboratory tests. By Alice C. Evans, Frank H. Robinson, and Leona Baumgartner. August 26, 1938. 19 pages.

1978. A comparative study of two strains of Rocky Mountain spotted fever virus with special reference to the Weil-Felix reaction. By Gordon E. Davis and R. R. Parker. August 26, 1938. 8 pages.

1979. Frequency of disabling illness among industrial employees during 1932-37 and the first quarter of 1938. By William M. Gafafer and Elizabeth S. Frasier. September 2, 1938. 10 pages.

1980. Changes in the types of visual refractive errors of children. A statistical study. By Antonio Ciocco. September 2, 1938. 8 pages.

1981. Percentage of illnesses treated surgically among 9,000 families. Based on Nation-wide periodic canvasses, 1928-31. By Selwyn D. Collins. September 9, 1938. 24 pages.

1982. Two new species of ticks (Ixodes) from California. (Acarina: Ixodidae). By R. A. Cooley and Glen M. Kohls. September 9, 1938. 6 pages.

1983. Incidence of rheumatic heart disease among college students in the United States. Based on replies to a questionnaire. By O. F. Hedley. September 16, 1938. 13 pages.

1984. Susceptibility of mice to spontaneous, induced, and transplantable tumors. A comparative study of eight strains. By H. B. Andervont. September 16, 1938. 19 pages.

1985. The incidence of induced subcutaneous and pulmonary tumors and spontaneous mammary tumors in hybrid mice. By H. B. Andervont. September 16, 1938. 7 pages.

1986. Studies on dental caries. VII. Sex differences in dental caries experience of elementary school children. By Henry Klein and Carroll E. Palmer. September 23, 1938. 6 pages.

1987. Studies of sewage purification. VII. Biochemical oxidation by activated sludge. By C. C. Ruchhoft, P. D. McNamee, and C. T. Butterfield. September 23, 1938. 29 pages.

1988. Cancer mortality in the United States in 1936 and recent preceding years. By Brock C. Hampton. May 20, 1938. 5 pages.

1989. Mottled enamel survey of Bauxite, Ark., ten years after a change in the common water supply. By H. Trendley Dean, Frederick S. McKay, and Elias Elvove. September 30, 1938. 13 pages; 3 plates.

1990. A simple method of concentrating vitamin E. By C. G. Mackenzie, Julia B. Mackenzie, and E. V. McCollum. October 7, 1938. 4 pages.

1991. City health officers, 1938. Directory of those in cities of 10,000 or more population. October 7, 1938. 18 pages.

1992. Poliomyelitis: Prevalence since 1915 and during first half of 1938. By Brock C. Hampton. July 8, 1938. 5 pages.

1993. Report of two cases of Rocky Mountain spotted fever in Ohio. By Merlin L. Cooper, Meyer A. Kurzner, Armine T. Wilson, and R. E. Dyer. October 7, 1938. 5 pages.

1994. Provisional mortality rates for the first six months of 1938. October 14, 1938. 8 pages.

1995. Effect of sodium selenite and selenate on the oxygen consumption of mammalian tissues. By C. I. Wright. October 14, 1938. 12 pages.

1996. The assay of urine in canine blacktongue by the use of Shigella paradysenteriae (Sonne). By H. F. Fraser, N. H. Topping, and W. H. Sebrell. October 14, 1938. 8 pages.

1997. Studies on immunizing substances in pneumococci. VII. Response in human beings to antigenic pneumococcus polysaccharides, types I and II. By Lloyd D. Felton. October 21, 1938. 24 pages.

1998. Studies on immunizing substances in pneumococci. VIII. Report on field tests to determine the prophylactic value of a pneumococcus antigen. By G. M. Ekwurzel, J. S. Simmons, Louis I. Dublin, and Lloyd D. Felton. October 21, 1938. 17 pages.

1999. Studies of sewage purification. VIII. Observations on the effect of variations in the initial numbers of bacteria and of the dispersion of sludge flocs on the course of oxidation of organic material by bacteria in pure culture. By C. T. Butterfield and Elsie Wattie. October 28, 1938. 24 pages.

2000. The isolation of Actinomyces bovis from tonsillar granules. By C. W. Emmons. November 4, 1938. 9 pages; 1 plate.

2001. The incidence and future expectancy of mental disease. By Harold F. Dorn. November 11, 1938. 14 pages.

2002. Studies on the mechanism of experimental intranasal infection in mice. By Charles Armstrong. November 11, 1938. 9 pages.

2003. The U. S. Marine Hospital (National Leprosarium), Carville, La. Review of the more important activities for the fiscal year ended June 30, 1938. By H. E. Hasseltine. November 18, 1938. 13 pages.

2004. Protozoan plankton as indicators of pollution in a flowing stream. By James B. Lackey. November 18, 1938. 22 pages.

2005. Comparison of modified Eijkman medium and standard lactose broth in the examination of oysters, clams, and shellfish-growing waters. By Velma Payne. November 18, 1938. 6 pages.

2006. Susceptibility of animals to endemic typhus virus. (Second report.) By George D. Brigham. November 25, 1938. 2 pages.

2007. The manipulation and counting of river plankton and changes in some organisms due to formalin preservation. By James B. Lackey. November 25, 1938. 14 pages.

2008. Fundamental cancer research. Report of a committee appointed by the Surgeon General. December 2, 1938. 10 pages.

2009. Studies on trichinosis. XII. The preparation and use of an improved trichina antigen. By John Bozicevich. December 2, 1938. 9 pages.

2010. A study of the economics of pneumonia. The costs of diagnosis and treatment of 625 cases in New York City. By Joseph Hirsh. December 9, 1938. 22 pages.

2011. Ixodes marmotae—A new species of tick from marmots. (Acarina: Ixodidae.) By R. A. Cooley and Glen M. Kohls. December 9, 1938. 8 pages.

2012. The problem of drug addiction. By Thomas Parran. December 16, 1938. 5 pages; 2 plates.

2013. Spontaneous lung carcinoma in mice. By John J. Bittner. December 16, 1938. 5 pages.

2014. A supplementary basic technique for the recovery of protozoan cysts and helminth eggs in feces. (Preliminary communication.) By Joseph S. D'Antoni and Vada Odom. December 16, 1938. 3 pages.

2015. Longevity of the tick Ornithodoros turicata and of Spirochaeta recurrentis within this tick. By Edward Francis. December 23, 1938. 21 pages; 3 plates.

2016. Use of yolk sac of developing chick embryo as medium for growing rickettsiae of Rocky Mountain spotted fever and typhus groups. By Herald R. Cox. December 23, 1938. 7 pages.

2017. A filter-passing infectious agent isolated from ticks. I. Isolation from Dermacentor andersoni, reactions in animals, and filtration experiments. By Gordon E. Davis and Herald R. Cox. II. Transmission by Dermacentor andersoni. By R. R. Parker and Gordon E. Davis. III. Description of organism and cultivation experiments. By Herald R. Cox. IV. Human infection. By R. E. Dyer. December 30, 1938. 24 pages.

2018. Riboflavin deficiency in man. A preliminary note. By W. H. Sebrell and R. E. Butler. December 30, 1938. 3 pages.

Supplements to the Public Health Reports

*138. Studies on drug addiction. With special reference to chemical structure of opium derivatives and allied synthetic substances and their physiological action. By Lyndon F. Small, Nathan B. Eddy, Erich Mosettig, and C. K. Himmelsbach. 1938. 143 pages. 60 cents (Buckram).

139. Report of the Joint Committee on Bathing Places. Conference of State Sanitary Engineers and American Public Health Association, 1937. 1938. 37 pages.

140. Syphilis control in industry. By R. R. Sayers. 1938. 9 pages.

141. A brief history of bacteriological investigations of the United States Public Health Service. By A. M. Stimson. 1938. 83 pages.

143. A statistical analysis of the clinical records of hospitalized drug addicts. By Michael J. Pescor. 1938. 30 pages.

144. Suggestibility in chronic alcoholics. By Victor H. Vogel. 1938. 6 pages; 1 plate.

145. The abuse of codeine. A review of codeine addiction and a study of the minimum cough-relieving dose. By Lowrey F. Davenport. 1938. 7 pages.

146. The mentally ill and mentally handicapped in institutions. By Joseph Zubin. 1938. 20 pages.

Public Health Bulletins

241. A study of asbestosis in the asbestos textile industry. By Waldemar C. Dreessen, J. M. DallaValle, Thomas I. Edwards, J. W. Miller, and R. R. Sayers. With the assistance of H. F. Easom and M. F. Trice. August 1938. 126 pages; 48 half tones.

243. Hospital facilities in the United States. I. Selected characteristics of hospital facilities in 1936. By Joseph W. Mountin, Elliott H. Pennell, and Evelyn Flook. II. Trends in hospital development, 1928–1936. By Joseph W. Mountin, Elliott H. Pennell, and Kay Pearson. September 1938. 53 pages.

National Institute of Health Bulletin

170. Graphic reproduction of the life cycle of the malaria parasite in the mosquito host. By Bruce Mayne. June 1938. 15 pages; 26 plates.

Miscellaneous Publication

31. Regulations for the control of the manufacture, importation, and sale of arsphenamine and its derivatives, referred to collectively as "the arsphenamines." Approved June 27, 1938. 1938. 3 pages.

Unnumbered Publication

*Index to Public Health Reports, volume 53, part 1 (January–June 1938). 1938. 26 pages. 5 cents.

Reprints from Venereal Disease Information

80. Recommendations for a gonorrhea control program. Report of an advisory committee to the U. S. Public Health Service. Vol. 19, January 1938. 5 pages.
81. Criteria governing the use of antisyphilitic drugs. By H. N. Cole. Vol. 19, January 1938. 9 pages.
82. The control of gonorrhea. By Ambrose J. King. Vol. 19, February 1938. 4 pages.
83. Syphilis epidemiology applied. Fifteen years' experience with contact-tracing and case-holding in New Jersey. By Norman R. Ingraham, Jr. Vol. 19, March 1938. 13 pages.
84. The control of venereal diseases. By Thomas Anwyl-Davies. Vol. 19, March 1938. 8 pages.
85. The value of consultation service in syphilis clinics. By Hugh J. Morgan. Vol. 19, April 1938. 4 pages.
86. Cooperation of the private physician in the control of prenatal syphilis. By P. C. Jeans. Vol. 19, April 1938. 2 pages.
87. Postgraduate education in syphilis. By Thomas B. Turner. Vol. 19, May 1938. 4 pages.
88. Importance of treatment in control of congenital syphilis. By Norman R. Ingraham, Jr. Vol. 19, May 1938. 5 pages.
89. Service provided physicians by the health department. By A. J. Casselman. Vol. 19, June 1938. 4 pages.
90. Scope of activities of the follow-up worker. By Edith M. Baker. Vol. 19, June 1938. 4 pages.
91. Regulations governing allotments and payments to States for the fiscal year 1939 from funds appropriated under the provisions of section 4 A of chapter XV of the act of July 9, 1918, as added to by the act of May 24, 1938 (Public, No. 540, 75th Cong.) Vol. 19, July 1938. 5 pages.
92. Next steps in the control of gonococcal infections. A round-table discussion. Vol. 19, July 1938. 7 pages.
93. The organization and function of follow-up service in venereal disease clinics. By Lena R. Waters and Louise Brown Ingraham. Vol. 19, July 1938. 5 pages.
94. The treatment of the severe complications of gonorrhea with hyperpyrexia produced by the Kettering hypertherm. By Theodore J. Bauer and Howard L. Cecil. Vol. 19, August 1938. 6 pages.
95. The management of gonorrhea in the male. Procedures recommended by the American Neisserian Medical Society, May 17, 1938. Vol. 19, August 1938. 4 pages.
96. The management of gonorrhea in the female. Procedures recommended by the American Neisserian Medical Society, May 17, 1938. Vol. 19, September 1938. 5 pages.

Venereal Disease Folder

2. Syphilis and Your Town. 12 pages.

DEATHS DURING WEEK ENDED JANUARY 14, 1939

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 14, 1939	Corresponding week, 1938
Data from 88 large cities of the United States:		
Total deaths	9,185	[1] 9,013
Average for 3 prior years	[1] 9,863	
Total deaths, first 2 weeks of year	18,327	18,643
Deaths under 1 year of age	544	[1] 550
Average for 3 prior years	[1] 583	
Deaths under 1 year of age, first 2 weeks of year	1,111	1,106
Data from industrial insurance companies:		
Policies in force	68,293,176	69,954,525
Number of death claims	13,728	13,846
Death claims per 1,000 policies in force, annual rate	10.5	10.3
Death claims per 1,000 policies, first 2 weeks of year, annual rate	8.8	9.4

[1] Data for 86 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (----) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

Cases of certain diseases reported by telegraph by State health officers for the week ended January 21, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median

Division and State	Diphtheria				Influenza				Measles			
	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38 median
NEW ENG.												
Maine	36	6	4	2	12	2	5	4	30	5	102	102
New Hampshire	0	0	0	1	----	----	----	----	0	0	117	46
Vermont	0	0	0	0	----	----	----	----	40	3	289	25
Massachusetts	6	5	6	7	----	----	----	----	502	427	144	370
Rhode Island	0	0	0	1	----	----	----	----	8	1	----	25
Connecticut	9	3	7	5	39	13	10	18	810	273	13	68
MID. ATL.												
New York	16	39	19	41	[1] 26	[1] 37	[1] 19	[1] 22	409	1,022	400	561
New Jersey	18	15	22	16	14	12	5	29	35	29	950	218
Pennsylvania	18	36	54	61	----	----	----	----	66	131	5,408	1,420
E. NO. CEN.												
Ohio	28	37	29	37	----	----	----	57	15	20	976	122
Indiana	33	22	83	30	33	22	28	60	10	7	547	293
Illinois [2]	28	43	39	39	39	60	42	57	29	45	3,848	219
Michigan [3]	13	12	7	16	1	1	----	6	540	511	664	50
Wisconsin	2	1	1	2	91	52	37	48	664	378	835	229
W. NO. CEN.												
Minnesota	12	6	10	8	6	3	4	1	1,688	871	17	79
Iowa	24	12	4	9	20	10	8	12	249	123	40	28
Missouri	18	14	29	29	31	24	176	212	17	13	1,344	276
North Dakota	29	4	2	5	88	12	3	17	1,906	261	5	8
South Dakota	45	6	0	1	----	----	----	----	2,712	361	----	28
Nebraska	11	3	2	4	----	----	----	2	210	55	5	27
Kansas	39	14	9	10	25	9	12	12	14	5	250	39

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended January 21, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Diphtheria				Influenza				Measles			
	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38 median
SO. ATL.												
Delaware	0	0	1	1				1	39	2	8	91
Maryland [3]	28	9	10	9	37	12	26	32	2,051	665	15	57
District of Columbia	24	3	8	12	49	6	1	5	41	5	12	12
Virginia	51	27	21	31	529	282			56	30	392	392
West Virginia	38	14	17	20	91	34	56	68	70	26	307	34
North Carolina [4]	57	39	23	29	41	28	35	60	766	524	797	559
South Carolina [4]	36	13	4	5	2,363	865	740	740	22	8	104	19
Georgia [4]	20	12	11	11	237	143		284	86	52	306	
Florida	33	11	12	10	6	2	5	5	121	40	182	8
E. SO. CEN.												
Kentucky	14	8	26	20	64	37	54	54	127	73	493	55
Tennessee [4]	25	14	13	20	153	87	159	200	125	71	575	32
Alabama [4]	23	13	17	17	331	188	272	313	257	146	150	150
Mississippi [3]	28	11	12	12								
W. SO. CEN.												
Arkansas	40	16	22	14	360	145	218	116	42	17	149	19
Louisiana [4]	39	16	15	31	29	12	26	26	206	85	5	15
Oklahoma	30	15	28	15	239	119	177	191	177	88	12	7
Texas [4]	36	44	53	71	440	531	739	413	162	195	104	301
MOUNTAIN												
Montana	0	0	0	0	309	33		8	5,523	590	2	7
Idaho	0	0	0	0	10	1	2	2	612	60	5	51
Wyoming	0	0	0	0					458	21	2	2
Colorado	39	8	7	7	149	31			308	64	282	24
New Mexico	12	1	3	3	250	21	2	7	605	49	192	32
Arizona	110	9	6	6	1,619	132	96	112	12	1	2	9
Utah [3]	0	0	6	1	20	2			288	29	44	16
PACIFIC												
Washington	0	0	1	2	3	1			361	117	46	110
Oregon	10	2	2	2	229	46	56	56	109	22	8	22
California [4]	30	36	24	52	67	82	131	131	1,446	1,763	110	148
Total	24	599	669	750	146	3,097	3,144	3,144	375	9,284	20,258	13,496
3 weeks	25	1,890	2,070	2,266	148	9,370	8,372	8,372	348	25,811	49,340	23,583

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38, median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38, median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38, median
NEW ENG.												
Maine	0	0	1	1	0	0	0	0	66	11	22	17
New Hampshire	0	0	0	0	0	0	0	0	162	16	17	11
Vermont	0	0	0	0	0	0	0	0	80	6	22	19
Massachusetts	1.2	1	0	2	0	0	0	0	229	195	276	235
Rhode Island	0	0	0	0	0	0	0	0	53	7	48	28
Connecticut	0	0	2	1	0	0	0	0	223	75	68	68
MID. ATL.												
New York	2.4	6	5	6	0	0	2	1	217	543	584	602
New Jersey	0	0	2	2	1.2	1	0	0	174	146	131	164
Pennsylvania	5	10	8	4	0	0	1	2	254	500	509	641

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended January 21, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Meningitis, meningococcus				Poliomyelitis				Scarlet fever			
	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38, median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38, median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934–38, median
E. NO. CEN.												
Ohio	0	0	1	2	2.3	3	2	1	281	366	300	390
Indiana	3	2	1	2	0	0	1	0	339	228	277	200
Illinois [3]	0.7	1	0	8	0	0	0	1	366	558	727	640
Michigan [3]	1.1	1	3	2	0	0	0	0	766	725	574	421
Wisconsin	0	0	0	1	0	0	2	0	532	303	204	339
W. NO. CEN.												
Minnesota	0	0	4	1	0	0	0	1	269	139	182	141
Iowa	0	0	0	1	0	0	1	0	284	140	280	165
Missouri	1.3	1	2	0	0	0	0	0	224	174	282	206
North Dakota	0	0	0	0	0	0	0	0	66	9	30	30
South Dakota	0	0	0	0	0	0	0	0	135	18	26	26
Nebraska	4	1	0	0	0	0	0	0	107	28	39	49
Kansas	0	0	0	1	0	0	1	0	421	151	198	198
SO. ATL.												
Delaware	0	0	0	0	0	0	0	0	138	7	14	15
Maryland [3]	6	2	2	3	0	0	0	0	167	54	62	81
Dist. of Col	0	0	1	1	0	0	0	0	105	13	15	18
Virginia	4	2	1	3	4	2	0	0	41	22	51	67
West Virginia	8	3	4	4	0	0	0	1	161	60	68	68
North Carolina [4]	1.5	1	3	2	0	0	0	0	85	58	41	45
South Carolina [4]	8	3	0	0	5	2	0	0	33	12	7	7
Georgia [4]	0	0	3	3	3	2	1	0	25	15	19	19
Florida	3	1	2	2	0	0	0	0	36	12	9	8
E. SO. CEN.												
Kentucky	7	4	8	7	0	0	1	1	149	86	118	68
Tennessee	1.8	1	3	3	1.8	1	0	1	83	47	35	38
Alabama [4]	1.8	1	4	1	1.8	1	3	1	32	18	31	19
Mississippi [3]	0	0	1	1	2.5	1	1	0	41	16	7	10
W. SO. CEN.												
Arkansas	0	0	1	1	2.5	1	0	0	22	9	7	11
Louisiana [4]	0	0	2	2	0	0	0	0	51	21	22	23
Oklahoma	0	0	2	3	0	0	1	0	103	51	93	29
Texas [4]	0	0	0	3	0	0	1	0	80	97	179	120
MOUNTAIN												
Montana	0	0	0	0	0	0	0	0	337	36	25	25
Idaho	10	1	0	0	0	0	0	0	388	38	51	24
Wyoming	0	0	0	0	0	0	0	0	131	6	13	13
Colorado	5	1	0	0	0	0	0	0	294	61	63	63
New Mexico	111	9	1	1	0	0	1	0	371	30	25	27
Arizona	0	0	0	1	0	0	0	0	74	6	10	24
Utah [3]	0	0	2	0	0	0	0	0	278	28	86	31
PACIFIC												
Washington	0	0	1	1	3	1	0	1	207	67	62	62
Oregon	0	0	1	1	10	2	2	0	313	63	47	47
California [4]	0.8	1	1	8	0.8	1	1	1	181	221	262	270
Total	2.1	53	72	74	0.7	18	22	24	218	5,492	6,218	6,218
3 weeks	2.1	157	273	425	0.7	50	59	71	202	15,238	17,428	18,020

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended January 21, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934-38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934-38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases
NEW ENG.											
Maine	0	0	0	0	0	0	0	1	127	21	68
New Hampshire	0	0	0	0	0	0	0	0	61	6	10
Vermont	0	0	0	0	27	2	0	0	670	50	26
Massachusetts	0	0	0	0	1	1	1	1	255	217	107
Rhode Island	0	0	0	0	0	0	0	0	0	0	43
Connecticut	0	0	0	0	0	0	1	1	276	93	42
MID ATL.											
New York	0	0	0	0	3	7	4	6	211	527	389
New Jersey	0	0	0	0	7	6	5	2	521	438	160
Pennsylvania	0	0	0	0	4	7	4	8	323	636	344
E. NO. CEN.											
Ohio	18	23	3	3	5	6	2	5	151	197	69
Indiana	154	104	48	3	3	2	0	1	42	28	17
Illinois [2]	14	21	51	8	5	7	2	8	294	449	124
Michigan [3]	0	0	7	0	2	2	1	2	405	383	220
Wisconsin	21	12	13	15	0	0	0	0	562	320	142
W. NO. CEN.											
Minnesota	54	28	51	16	0	0	2	2	138	71	37
Iowa	85	42	60	12	2	1	0	1	43	21	42
Missouri	23	18	70	5	1	1	7	6	19	15	112
North Dakota	15	2	26	5	0	0	1	0	212	29	63
South Dakota	75	10	10	4	0	0	0	0	23	3	26
Nebraska	0	0	1	13	4	1	0	0	4	1	10
Kansas	92	33	8	8	3	1	2	2	47	17	122
SO. ATL.											
Delaware	0	0	0	0	0	0	0	0	157	8	7
Maryland [3]	0	0	0	0	9	3	4	3	179	58	62
District of Columbia	0	0	0	0	8	1	3	2	259	32	3
Virginia	0	0	0	0	11	6	2	7	82	44	93
West Virginia	3	1	1	0	24	9	0	2	81	30	128
North Carolina [4]	0	0	2	1	3	2	5	4	472	323	326
South Carolina [4]	0	0	0	0	5	2	6	4	216	79	47
Georgia [4]	0	0	0	0	3	2	3	3	33	20	51
Florida	0	0	2	0	0	0	2	2	45	15	14
E. SO. CEN.											
Kentucky	3	2	33	0	3	2	1	2	7	4	92
Tennessee	2	1	7	0	2	1	2	3	62	35	31
Alabama [4]	0	0	3	2	2	1	5	3	51	29	33
Mississippi [3]	0	0	7	1	5	2	0	1			
W. SO. CEN.											
Arkansas	12	5	24	2	7	3	4	4	35	14	64
Louisiana [4]	0	0	3	2	15	6	14	5	10	4	8
Oklahoma	16	8	4	1	4	2	6	3	8	4	40
Texas [4]	11	13	24	6	8	10	18	15	72	87	193
MOUNTAIN											
Montana	28	3	12	12	19	2	1	0	225	24	31
Idaho	92	9	42	2	20	2	2	1	51	5	40
Wyoming	22	1	6	7	0	0	0	0	218	10	8
Colorado	39	8	15	1	0	0	0	0	226	47	7
New Mexico	86	7	1	0	25	2	0	3	507	41	32
Arizona	442	36	2	0	0	0	0	0	37	3	15
Utah [3]	0	0	0	0	0	0	0	0	70	7	29

See footnotes at end of table.

Cases of certain diseases reported by telegraph by State health officers for the week ended January 21, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median—Continued

Division and State	Smallpox				Typhoid and paratyphoid fever				Whooping cough		
	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934-38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases	1934-38 median	Jan. 21, 1939, rate	Jan. 21, 1939, cases	Jan. 22, 1938, cases
PACIFIC											
Washington	3	1	34	27	6	2	0	1	86	28	138
Oregon	25	5	34	5	0	0	1	1	104	21	21
California [4]	16	20	34	10	4	5	5	5	94	115	423
Total	16	413	638	263	4	109	116	116	186	4,609	4,104
3 weeks	15	1,160	1,834	679	4	329	369	392	175	12,963	11,624

[1] New York City only.
[2] Rocky Mountain spotted fever, week ended Jan. 21, 1939, Illinois, 1 case.
[3] Period ended earlier than Saturday.
[4] Typhus fever, week ended Jan. 21, 1939, 43 cases, as follows: North Carolina, 2; South Carolina, 10; Georgia, 16; Tennessee, 1; Alabama, 5; Louisiana, 1; Texas, 6; California, 2.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningitis, meningococcus	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid and paratyphoid fever
December 1938										
Alabama	14	130	532	140	232	14	10	135	0	14
Arizona	9	38	789	1	17	3	0	30	21	8
Arkansas	2	70	659	111	103	33	6	112	11	17
California	8	201	178	4	3,590	6	6	844	28	11
Colorado	6	48	94	-------	72	-------	0	169	24	14
Connecticut	1	21	27	-------	267	-------	1	216	0	1
Idaho	6	7	25	-------	300	-------	0	79	41	11
Indiana	5	108	73	-------	53	-------	0	765	182	14
Iowa	2	46	29	-------	531	-------	1	403	30	27
Kansas	3	43	33	-------	20	-------	1	628	23	-------
Kentucky	12	83	185	1	108	4	1	422	1	23
Louisiana	3	71	43	29	117	6	3	77	2	26
Maine	0	105	8	-------	28	-------	0	74	0	5
Maryland	1	32	50	-------	461	-------	0	174	0	18
Michigan	8	68	5	4	875	-------	0	2,254	24	32
Minnesota	2	42	18	-------	1,865	-------	1	545	102	8
Mississippi	2	45	6,452	1,267	1,370	243	6	50	0	9
Missouri	4	81	192	3	17	-------	2	531	65	21
Nebraska	0	13	13	-------	22	-------	2	130	15	2
New Jersey	6	65	44	-------	77	-------	3	342	0	9
New Mexico	0	23	4	-------	46	3	1	89	1	13
New York	18	103	-------	15	3,465	-------	2	1,545	0	31
Rhode Island	0	1	-------	-------	4	-------	1	41	0	1
South Dakota	0	32	64	-------	861	-------	0	146	35	2
Tennessee	13	94	244	19	117	15	1	275	1	5

December 1938

	Cases
Actinomycosis:	
Maine	1
Minnesota	1
Anthrax in man:	
California	1
New Jersey	2
Botulism: California	1
Chickenpox:	
Alabama	158
Arizona	87
Arkansas	111
California	2,188

December 1938—Continued

Chickenpox—Continued.	Cases
Colorado	283
Connecticut	480
Idaho	119
Indiana	492
Iowa	308
Kansas	491
Kentucky	464
Louisiana	22
Maine	358
Maryland	258
Michigan	2,663

December 1938—Continued

Chickenpox—Continued.	Cases
Minnesota	472
Mississippi	753
Missouri	255
Nebraska	143
New Jersey	1,275
New Mexico	43
New York	2,760
Rhode Island	123
South Dakota	188
Tennessee	276
Dengue: Mississippi	2

Summary of monthly reports from States—Continued

December 1938—Continued

	Cases
Diarrhea:	
Maryland	25
New Mexico	3
Dysentery:	
Arizona	50
Arkansas (amoebic)	3
Arkansas (bacillary)	4
California (amoebic)	5
California (bacillary)	35
Connecticut (bacillary)	9
Iowa (bacillary)	2
Kansas (bacillary)	1
Kentucky (bacillary)	1
Louisiana (amoebic)	3
Louisiana (bacillary)	3
Maryland (bacillary)	14
Michigan (amoebic)	5
Michigan (bacillary)	20
Minnesota (bacillary)	3
Mississippi (amoebic)	116
Mississippi (bacillary)	246
Missouri	6
New Jersey (amoebic)	1
New Mexico (amoebic)	1
New Mexico (bacillary)	10
New Mexico (unspecified)	11
New York (amoebic)	9
New York (bacillary)	86
Tennessee (amoebic)	4
Tennessee (bacillary)	8
Encephalitis, epidemic or lethargic:	
Arizona	3
Arkansas	1
California	3
Colorado	1
Idaho	3
Indiana	1
Iowa	2
Kansas	5
Kentucky	7
Louisiana	2
Missouri	1
New Jersey	7
New York	6
Rhode Island	2
South Dakota	3
Tennessee	1
Food poisoning:	
California	73
Idaho	1
Kansas	1
New Mexico	1
German measles:	
Alabama	1
Arizona	3
Arkansas	1
California	84
Connecticut	16
Idaho	6
Kansas	11
Kentucky	3
Maine	15
Maryland	12
Michigan	92
New Jersey	39
New York	84
Tennessee	5
Granuloma, Coccidioidal:	
California	6
Hookworm disease:	
Louisiana	5
Mississippi	441
Tennessee	1
Impetigo contagiosa:	
Kansas	3
Maryland	15
South Dakota	3
Tennessee	12
Jaundice:	
Maryland	10
Michigan	55
Leprosy:	
California	1
Louisiana	1

December 1938—Continued

	Cases
Mumps:	
Alabama	43
Arizona	13
Arkansas	19
California	2,001
Colorado	8
Connecticut	188
Idaho	64
Indiana	137
Iowa	50
Kansas	305
Kentucky	115
Maine	26
Maryland	167
Michigan	421
Mississippi	91
Missouri	161
Nebraska	29
New Jersey	430
New Mexico	5
Rhode Island	213
South Dakota	23
Tennessee	57
Ophthalmia neonatorum:	
Arkansas	1
California	1
Indiana	1
Kansas	1
Minnesota	1
Mississippi	6
New Jersey	13
New Mexico	3
New York	5
Tennessee	1
Puerperal septicemia:	
Idaho (delayed report)	11
Mississippi	28
New Mexico	1
Tennessee	2
Rabies in animals:	
Alabama	31
Arkansas	21
California	100
Connecticut	3
Indiana	29
Iowa	2
Louisiana	9
Maryland	1
Michigan	1
Minnesota	8
Mississippi	14
Missouri	4
New Jersey	83
New Mexico	4
New York	11
Rhode Island	1
Rabies in man:	
Kansas	1
Tennessee	1
Rocky Mountain spotted fever:	
Maryland	1
Scabies:	
Kansas	6
Maryland	1
Septic sore throat:	
Arkansas	62
California	14
Colorado	4
Connecticut	8
Idaho	9
Iowa	10
Kansas	3
Kentucky	16
Louisiana	2
Maine	4
Maryland	39
Michigan	8
Minnesota	15
Missouri	49
New Jersey	15
New Mexico	10
New York	88
Rhode Island	15
South Dakota	13
Tennessee	15

December 1938—Continued

	Cases
Tetanus:	
Alabama	2
California	3
Connecticut	1
Idaho	1
Louisiana	5
Maryland	2
Michigan	22
Minnesota	1
New York	2
Tennessee	1
Trachoma:	
Arizona	41
California	20
Kentucky	3
Michigan	1
Minnesota	1
Mississippi	2
Missouri	17
New Jersey	1
South Dakota	1
Trichinosis:	
California	2
Connecticut	7
Maine	2
Michigan	4
New York	11
Tularemia:	
Arkansas	19
California	1
Colorado	1
Indiana	111
Iowa	82
Kansas	19
Kentucky	78
Louisiana	1
Maryland	26
Michigan	3
Minnesota	1
Missouri	121
New Jersey	5
New Mexico	4
New York	1
South Dakota	1
Tennessee	16
Typhus fever:	
Alabama	38
California	8
Kansas	1
Louisiana	3
Maryland	1
Mississippi	6
New Jersey	1
Tennessee	6
Undulant fever:	
Alabama	3
Arizona	2
Arkansas	1
California	22
Colorado	2
Connecticut	11
Indiana	5
Iowa	8
Kansas	6
Kentucky	4
Louisiana	2
Maine	1
Maryland	5
Michigan	18
Minnesota	7
Missouri	3
New Jersey	7
New Mexico	1
New York	30
South Dakota	1
Tennessee	2
Vincent's infection:	
Idaho	2
Kansas	17
Maine	9
Maryland	8
Michigan	13
New York	72
Tennessee	7

Summary of Monthly Reports from States—Continued

December 1938—Continued

Whooping cough:	Cases
Alabama	199
Arizona	43
Arkansas	98
California	414
Colorado	130
Connecticut	336
Idaho	6
Indiana	66
Iowa	75
Whooping cough—Contd.	
Kansas	87
Kentucky	99
Louisiana	36
Maine	226
Maryland	146
Michigan	1,234
Minnesota	78
Mississippi	639
Missouri	87
Whooping cough—Contd.	
Nebraska	25
New Jersey	1,463
New Mexico	91
New York	2,522
Rhode Island	157
South Dakota	27
Tennessee	140

CASES OF VENEREAL DISEASES REPORTED FOR NOVEMBER 1938

These reports are published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases. The figures are taken from reports received from State and city health officers. They are preliminary and are therefore subject to correction. It is hoped that the publication of these reports will stimulate more complete reporting of these diseases.

Reports from States

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	1,626	5.62	278	.96
Arizona	129	3.13	100	2.43
Arkansas	886	4.33	255	1.25
California	2,113	3.43	1,428	2.32
Colorado	95	.89	65	.61
Connecticut	220	1.26	128	.74
Delaware	305	11.69	46	1.76
District of Columbia	564	9.00	321	5.12
Florida	990	5.93	102	.61
Georgia	3,046	9.87	296	.96
Idaho	28	.57	24	.49
Illinois	2,931	3.72	1,483	1.88
Indiana	317	.91	100	.29
Iowa [1]				
Kansas	156	.84	65	.35
Kentucky	702	2.40	307	1.05
Louisiana	756	3.55	61	.29
Maine	30	.35	50	.58
Maryland	1,370	8.16	317	1.89
Massachusetts	503	1.14	421	.95
Michigan	1,526	3.16	531	1.10
Minnesota	244	.92	192	.72
Mississippi	1,971	9.74	2,511	12.41
Missouri	625	1.57	98	.25
Montana	52	.96	22	.41
Nebraska	49	.36	59	.43
Nevada	24	2.38	11	1.09
New Hampshire [1]				
New Jersey	786	1.81	222	.51
New Mexico	181	4.29	23	.55
New York	5,185	4.00	1,987	1.53
North Carolina	5,010	14.35	614	1.76
North Dakota	25	.35	29	.41
Ohio	1,066	1.58	304	.45
Oklahoma [1]				
Oregon	89	.87	152	1.48
Pennsylvania	1,133	1.11	161	.16
Rhode Island	117	1.72	33	.48
South Carolina	562	3.00	478	2.55
South Dakota	18	.26	29	.42
Tennessee	1,030	3.56	307	1.06
Texas	655	1.06	238	.39
Utah	14	.27	26	.50
Vermont	17	.44	26	.68
Virginia	2,310	8.54	326	1.20
Washington	295	1.78	321	1.94
West Virginia	344	1.84	102	.55
Wisconsin [1]				
Wyoming [1]				
Total	40,095	3.33	14,640	1.22

See footnotes at end of table.

Reports from cities of 200,000 population or over

	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Akron, Ohio [2]				
Atlanta, Ga	245	8.16	88	2.93
Baltimore, Md	782	9.36	212	2.54
Birmingham, Ala	325	11.08	64	2.17
Boston, Mass	181	2.28	165	2.07
Buffalo, N. Y	119	1.98	41	.68
Chicago, Ill	2,122	5.79	1,083	2.95
Cincinnati, Ohio	168	3.56	62	1.31
Cleveland, Ohio	201	2.13	83	.88
Columbus, Ohio	86	2.74	25	.80
Dallas, Tex	240	7.90	114	3.75
Dayton, Ohio	56	2.53	0	
Denver, Colo	79	2.62	50	1.66
Detroit, Mich	629	3.47	264	1.45
Houston, Tex.[1]				
Indianapolis, Ind	14	.36	23	.60
Jersey City, N. J	34	1.05	13	.40
Kansas City, Mo	59	1.37	3	.07
Los Angeles, Calif.[1]				
Louisville, Ky	209	6.17	94	2.77
Memphis, Tenn	361	12.36	69	2.36
Milwaukee, Wis.[2]				
Minneapolis, Minn.[1]				
Newark, N. J	326	7.18	163	3.59
New Orleans, La	99	2.02	53	1.08
New York, N. Y	4,003	5.34	1,486	1.98
Oakland, Calif	29	.93	18	.57
Omaha, Nebr	33	1.48	23	1.03
Philadelphia, Pa	371	1.85		
Pittsburgh, Pa	345	4.90	28	.40
Portland, Oreg	61	1.90	120	3.74
Providence, R. I.[1]				
Rochester, N. Y	40	1.17	35	1.02
St. Louis, Mo	260	3.08	57	.68
St. Paul, Minn.[1]				
San Antonio, Tex	135	5.16	43	1.64
San Francisco, Calif	156	2.26	212	3.08
Seattle, Wash	145	3.75	118	3.05
Syracuse, N. Y	77	3.42	21	.93
Toledo, Ohio [1]				
Washington, D. C	564	9.00	321	5.12

[1] No report for current month.
[2] Not reporting.

WEEKLY REPORTS FROM CITIES

City reports for week ended January 14, 1939

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Data for 90 cities:											
5-year average	211	1,145	150	2,415	1,040	1,690	29	376	22	1,108	--------
Current week [1]	183	260	61	3,049	771	1,509	39	336	23	1,727	--------
Maine:											
Portland	0	------	0	0	2	1	0	1	0	1	18
New Hampshire:											
Concord	0	------	1	0	2	1	0	1	0	0	12
Manchester	0	------	0	0	0	1	0	1	0	0	14
Nashua	0	------	0	0	0	1	0	0	0	0	5
Vermont:											
Barre	0	------	0	1	0	1	0	0	0	10	1
Burlington	0	------	0	1	0	0	0	0	0	2	9
Rutland	0	------	0	0	0	0	0	0	0	0	5
Massachusetts:											
Boston	0	------	0	104	32	67	0	5	0	37	251
Fall River	0	------	0	0	5	0	0	0	0	1	35
Springfield	0	------	0	17	3	0	0	0	0	3	38
Worcester	0	------	0	0	9	11	0	3	0	37	59
Rhode Island:											
Pawtucket	1	------	0	2	0	0	0	0	0	5	15
Providence	0	------	0	2	6	1	0	1	0	81	74
Connecticut:											
Bridgeport	0	------	0	3	2	7	0	0	1	5	28
Hartford	0	------	0	24	2	8	0	1	0	19	44
New Haven	0	1	0	10	4	1	0	0	0	13	47
New York:											
Buffalo	0	------	2	60	8	49	0	3	0	36	129
New York	34	57	7	44	148	137	0	79	6	201	1,644
Rochester	0	------	0	29	8	21	0	0	0	22	77
Syracuse	0	------	0	28	7	16	0	0	0	47	48
New Jersey:											
Camden	2	1	0	0	2	9	0	0	1	5	25
Newark	0	------	1	3	6	41	0	7	0	55	106
Trenton	0	------	0	1	6	4	0	4	0	7	49
Pennsylvania:											
Philadelphia	4	8	2	15	36	52	0	25	2	166	592
Pittsburgh	1	1	0	1	15	32	0	8	0	37	160
Reading	2	------	0	2	3	1	0	1	0	0	37
Scranton	0	------	-------	0	-------	24	0	-------	1	8	-------
Ohio:											
Cincinnati	------	------	------	------	------	------	------	------	------	------	------
Cleveland	0	14	3	3	18	50	0	13	1	59	214
Columbus	2	------	0	4	7	19	0	1	0	9	96
Toledo	0	------	0	0	9	30	0	2	0	31	72
Indiana:											
Anderson	1	------	0	0	4	5	0	0	0	1	10
Fort Wayne	2	------	0	0	4	12	0	0	0	0	29
Indianapolis	9	------	2	2	18	46	30	4	0	7	109
Muncie	0	------	0	0	5	1	0	0	0	0	10
South Bend	0	------	0	0	2	7	0	0	0	0	21
Terre Haute	------	------	------	------	------	------	------	------	------	------	------
Illinois:											
Chicago	21	7	6	19	63	203	0	37	0	316	754
Elgin	0	------	0	0	2	14	0	0	0	0	5
Springfield	0	------	0	1	0	6	0	0	0	2	21
Michigan:											
Detroit	10	1	1	13	15	139	0	8	0	183	259
Flint	------	------	------	------	------	------	------	------	------	------	------
Grand Rapids	0	------	1	1	2	20	0	0	0	1	56
Wisconsin:											
Kenosha	0	------	0	0	0	5	0	0	0	24	7
Madison	0	------	0	1	1	4	0	0	0	4	10
Milwaukee	0	2	2	2	7	129	0	2	0	125	112
Racine	0	------	0	5	0	8	0	0	0	6	12
Superior	0	------	0	0	0	1	0	0	0	0	6

[1] Figures for Cincinnati, O., Terre Haute, Ind., Flint, Mich., Charleston, W. Va., and Los Angeles, Calif., estimated; reports not received.

City reports for week ended January 14, 1939—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Minnesota:											
Duluth	0	------	0	3	3	4	0	1	0	4	29
Minneapolis	1	------	3	246	10	25	0	2	1	27	124
St. Paul	0	------	0	430	9	26	0	1	0	2	77
Iowa:											
Cedar Rapids	0	------	------	0	------	1	0	------	0	0	------
Davenport	0	------	------	1	------	2	2	------	0	0	------
Des Moines	1	------	0	1	0	23	0	0	0	0	29
Sioux City	2	------	0	37	------	3	0	------	0	10	------
Waterloo	2	------	------	1	------	12	0	------	0	0	------
Missouri:											
Kansas City	1	------	0	1	18	16	0	6	0	1	101
St. Joseph	0	------	0	0	4	2	0	0	0	0	21
St. Louis	8	------	2	1	21	34	1	6	0	9	210
North Dakota:											
Fargo	0	------	------	2	2	0	0	0	0	0	5
Grand Forks	0	------	------	1	------	0	0	------	0	0	------
Minot	0	------	0	49	0	0	0	0	0	0	8
South Dakota:											
Aberdeen	2	0	------	0	------	2	0	------	0	0	------
Nebraska:											
Lincoln	0	------	------	4	------	3	0	------	1	0	------
Omaha	0	------	0	3	8	4	0	2	0	1	64
Kansas:											
Lawrence	0	1	0	2	1	0	0	0	0	0	3
Topeka	0	------	0	0	3	6	0	1	0	2	18
Wichita	1	------	0	0	2	11	0	1	0	0	33
Delaware:											
Wilmington	2	------	0	3	7	5	0	0	0	4	38
Maryland:											
Baltimore	1	5	1	435	23	23	0	11	0	24	250
Cumberland	0	------	0	0	1	0	0	0	0	0	13
Frederick	2	------	0	1	1	0	0	0	0	0	5
Dist. of Col.:											
Washington	5	2	1	11	23	12	0	11	0	28	197
Virginia:											
Lynchburg	0	------	0	4	1	3	0	0	0	0	8
Norfolk	1	6	1	1	2	8	0	0	0	6	25
Richmond	3	------	1	0	5	5	0	1	0	1	58
Roanoke	3	------	0	0	2	0	0	0	0	0	16
West Virginia:											
Charleston	------	------	------	------	------	------	------	------	------	------	------
Huntington	2	------	------	0	------	0	0	------	0	0	------
Wheeling	0	------	0	0	3	1	0	0	1	2	20
North Carolina:											
Gastonia	1	------	------	1	------	0	0	------	0	3	------
Raleigh	0	------	0	2	0	1	0	0	0	3	6
Wilmington	1	------	0	1	1	0	0	0	0	9	11
Winston-Salem	0	2	0	15	2	1	0	0	0	0	7
South Carolina:											
Charleston	1	65	2	0	2	2	0	1	0	5	27
Florence	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	0	4	1	0	0	0	1	15
Georgia:											
Atlanta	0	33	1	1	10	6	0	2	0	0	76
Brunswick	0	------	0	0	0	1	0	0	0	0	2
Savannah	0	21	0	0	2	1	0	0	1	5	33
Florida:											
Miami	2	------	0	0	5	0	0	0	0	0	24
Tampa	1	1	1	3	2	1	0	0	0	0	21
Kentucky:											
Ashland	0	4	0	0	3	0	0	0	0	0	12
Covington	0	------	0	0	2	12	0	1	0	0	12
Lexington	1	3	0	0	4	1	0	0	0	0	20
Louisville	4	4	0	4	9	20	0	2	0	0	73
Tennessee:											
Knoxville	1	2	2	0	2	4	0	1	0	0	33
Memphis	0	3	6	0	6	3	1	10	0	3	110
Nashville	0	------	3	0	3	7	0	4	0	10	52
Alabama:											
Birmingham	0	16	3	1	9	1	0	1	1	0	70
Mobile	1	------	0	0	1	2	0	2	1	0	31
Montgomery	1	6	------	4	------	1	0	------	0	0	------
Arkansas:											
Fort Smith	0	------	------	1	------	1	0	------	0	0	------
Little Rock	2	------	1	0	5	1	0	0	0	1	6

City reports for week ended January 14, 1939—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
Louisiana:											
Lake Charles	0	-----	0	2	1	0	0	0	0	0	6
New Orleans	13	5	5	17	21	4	0	10	3	1	164
Shreveport	0	-----	0	1	6	10	0	1	2	0	40
Oklahoma:											
Oklahoma City	0	-----	0	4	8	8	0	1	0	0	50
Tulsa	0	-----	-----	10	-----	5	0	0	-----	0	-----
Texas:											
Dallas	0	-----	0	2	8	17	5	1	0	0	58
Fort Worth	1	12	0	0	6	7	0	2	0	1	37
Galveston	4	-----	0	0	4	4	0	1	0	0	15
Houston	2	-----	0	0	10	4	0	3	1	0	86
San Antonio	0	-----	0	0	6	3	0	8	0	0	51
Montana:											
Billings	0	-----	0	92	1	1	0	1	0	0	13
Great Falls	0	-----	0	2	2	1	0	0	0	0	7
Helena	1	-----	0	3	1	0	0	0	0	0	3
Missoula	0	-----	0	4	0	0	0	0	0	0	7
Idaho:											
Boise	0	-----	0	0	2	0	0	0	0	0	11
Colorado:											
Colorado Sprgs	0	-----	0	5	3	3	0	2	0	3	6
Denver	12	-----	1	5	10	5	0	3	0	26	68
Pueblo	1	-----	0	0	4	3	0	0	0	0	14
New Mexico:											
Albuquerque	0	-----	0	0	2	4	0	1	0	0	13
Utah:											
Salt Lake City	0	-----	0	0	2	8	0	1	0	4	27
Washington:											
Seattle	0	-----	0	4	5	9	0	2	0	5	95
Spokane	0	-----	0	9	3	0	0	2	0	1	36
Tacoma	0	-----	0	3	1	5	1	3	0	0	29
Oregon:											
Portland	0	-----	0	6	3	10	3	4	0	0	104
Salem	0	1	-----	0	-----	1	2	-----	1	0	-----
California:											
Los Angeles	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sacramento	1	-----	0	14	2	1	1	1	0	2	35
San Francisco	3	-----	0	1,214	12	26	0	12	0	14	186

State and city	Meningitis meningococcus, Cases	Meningitis meningococcus, Deaths	Poliomyelitis cases	State and city	Meningitis meningococcus, Cases	Meningitis meningococcus, Deaths	Poliomyelitis cases
Massachusetts:				Louisiana:			
Boston	1	0	0	Shreveport	0	2	0
New York:				Oklahoma:			
Buffalo	6	0	0	Tulsa	2	0	0
New York	4	2	0	Colorado:			
Pennsylvania:				Denver	1	1	0
Philadelphia	1	0	0	Washington:			
Tennessee:				Seattle	0	0	1
Nashville	1	1	0	California:			
Alabama:				San Francisco	0	0	1
Birmingham	1	0	0				

Encephalitis, epidemic or lethargic.—Cases: Fall River, 1; New York, 5; Washington, 1; Huntington, 1; Atlanta, 4; Mobile, 1.

Pellagra.—Cases: Savannah, 2.

Typhus fever.—Cases: Charleston, S. C., 2; Atlanta, 2; Montgomery, 1; New Orleans, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 31, 1938.—During the 2 weeks ended December 31, 1938, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia [1]	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis					3				1	4
Chickenpox		21	15	379	504	45	80	15	102	1,161
Diphtheria		8	3	86	9	9	96	1		212
Dysentery					7					7
Erysipelas				5	10	5	4	1	3	28
Influenza		12		2	10				34	58
Measles		11		257	1,052	41	12	3	20	1,396
Mumps		40			71	49	2	6	10	178
Pneumonia		7			33			2	37	79
Poliomyelitis				2		2	1			5
Scarlet fever		21	20	179	309	60	97	48	25	759
Smallpox						1	2			3
Trachoma							6			6
Tuberculosis	1	26	10	113	80	3	15		38	286
Typhoid fever				20	6		1	3	2	32
Undulant fever					1					1
Whooping cough		10	6	187	359	19	7	1	83	672

[1] For 2 weeks ended January 4, 1939.

CUBA

Habana—Communicable diseases—4 weeks ended December 17, 1938.—During the 4 weeks ended December 17, 1938, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	11	1	Tuberculosis	7	1
Malaria	34	1	Typhoid fever	14	3
Scarlet fever	2				

MALTESE ISLANDS

Vital statistics—Year 1937.—Following are vital statistics for the Maltese Islands for the year 1937:

	Number	Rate per 1,000 population		Number	Rate per 1,000 population
Population	264,663		Deaths from—Continued.		
Marriages	1,806	6.8	Lethargic encephalitis	3	
Live births	8,879	33.54	Malaria	1	
Deaths	5,304	20.04	Plague	2	
Deaths under 1 year of age	2,155	[1] 242.70	Pneumonia	132	
Deaths from—			Puerperal sepsis	13	
Cerebrospinal fever	1		Tuberculosis	128	
Diphtheria	23		Typhoid fever	27	
Erysipelas	8		Undulant fever	60	
Influenza	24		Whooping cough	11	

[1] Per 1,000 live births.

SWEDEN

Communicable diseases—November 1938.—During the month of November 1938, cases of certain communicable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Poliomyelitis	[1] 166
Diphtheria	7	Scarlet fever	2,681
Dysentery	19	Syphilis	37
Epidemic encephalitis	6	Typhoid fever	15
Gonorrhea	1,155	Undulant fever	14
Paratyphoid fever	6	Weil's disease	5

[1] Includes 37 cases nonparalytic at time of notification.

VIRGIN ISLANDS

Notifiable diseases—October–December 1938.—During the months of October, November, and December 1938, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	October	November	December	Disease	October	November	December
Dysentery (amoebic)		1	2	Pneumonia		2	1
Filariasis	3	6	4	Schistosomiasis	1		1
Gonorrhea	16	6	13	Syphilis	15	24	4
Hookworm disease	2	1	4	Tuberculosis	2		
Malaria			2	Whooping cough	8		6
Pellagra		5					

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for January 27, 1939, pages 137–148. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Hawaii Territory—Island of Hawaii—Hamakua District.—For the period December 22 to 30, 1938, rats proved positive for plague have been reported as follows: Hamakua Mill Sector—Kukaiau, 10 rats; Kaiwiki, 1 rat; Paauhau Sector, 1 rat, all in Hamakua District, Island of Hawaii, T. H.

Siam—Bayab Circle—Prae (urban district).—On January 12, 1939, 1 death from plague was reported in the urban district of Prae, Bayab Circle, Siam.

Yellow Fever

Nigeria.—Yellow fever has been reported in Nigeria as follows: Tchad—Oshogbo, January 10, 1939, 1 death; Fort Lamy, January 13, 1939, 1 suspected death from yellow fever.